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The GRASSES of British Columbia

By William A. Hubbard
Illustrations by Frank L. Beebe

VICTORIA, B.C. APRIL, 1955

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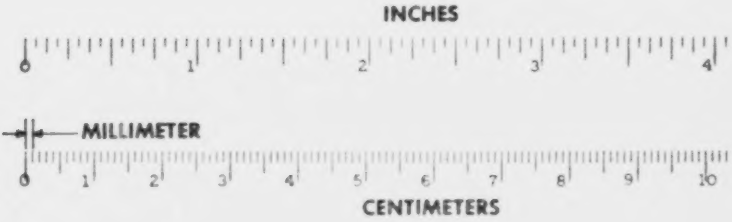
10 centimetres = 1 decimetre (dm.)
10 decimetres = 1 metre (m.)
1,000 metres = 1 kilometre (km.)

METRIC AND ENGLISH CONVERSION TABLE

LINEAR MEASURE

1 kilometre = 0.6214 mile
1 metre = 39.37 inches
3.2808 feet
1.0936 yards
1 centimetre = 0.3937 inch
1 millimetre = 0.03937 inch
1 mile = 1.609 kilometres
1 yard = 0.9144 metre
1 foot = 0.3048 metre
1 foot = 304.8 millimetres
1 inch = 2.54 centimetres
1 inch = 25.4 millimetres


INCHES
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1955

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Grasses of British Columbia

INTRODUCTION

The grasses which make up the family Gramineæ include about 6,000 species, many of which are world-wide in distribution. In British Columbia there are over 300 species, most of which are indigenous to the Province.

This very large family contains the most valuable of all plants used by man. To the grasses belong the cereals, wheat, oats, and barley; sugarcane; sorghum; and the bamboos. Bluegrass, brome grass, the fescues, and many others also furnish the bulk of the forage for domestic animals and hence are the basis of the live-stock industry.

Grasses are also important in protecting the soil from destructive erosion, for industrial arts, for lawns and golf-courses, as well as for ornamentals. So adaptable are they that they occupy all parts of the habitable earth. In height they vary from less than an inch in the far north to more than 100 feet in the tropics, where the tallest of the bamboos form extensive forests of impenetrable jungles.

Grasses are herbs (in temperate regions), with fibrous roots and jointed culms (stems), mostly hollow (rarely pithy) except at the solid nodes. The culms are either simple (non-branching) or they may bear branches at the nodes.

The leaves are borne one at each node, always in two ranks. They are parallel-veined and composed of two parts: the sheath, which surrounds the culms like a split tube, and the blade, which is usually long and narrow. At the junction of the sheath and the blade, on the inside, is a small appendage, the ligule (Fig. 1).

The flowers are small, composed of a single ovary with two styles (one in corn) bearing feathery stigmas, and three stamens, rarely one or six. The ovary contains a single cavity and bears a single seed, the coat of which in many cases is fused with the

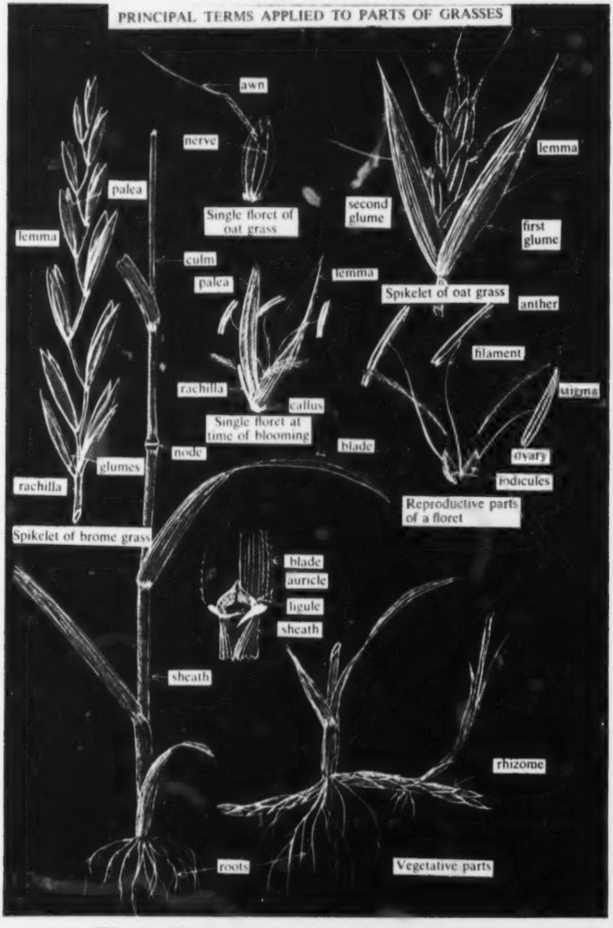
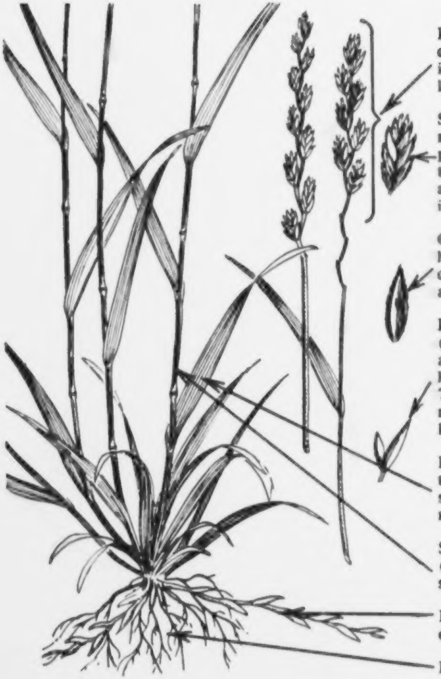

PRINCIPAL TERMS APPLIED TO PARTS OF GRASSES
awn
nerve
Single floret of oat grass
palea
lemma
culm
palea
rachilla
callus
Single floret at time of blooming
node
glumes
rachilla
Spikelet of brome grass
second glume
lemma
first glume
lemma
Spikelet of oat grass
anther
filament
stigma
blade
ovary
lodicules
Reproductive parts of a floret
blade
auricle
ligule
sheath
sheath
rhizome
roots
Vegetative parts

Fig. 1. Floral and vegetal diagram of grasses.



Agropyron dasystachyum

Flower heads (spikes)—terminal, erect, up to 15 cm. (6 in.) long, the individual flower groups (spikelets) rather distant to crowded.

Spikelets—up to 8-flowered, rounded or slightly flattened, placed flatwise at the angles of the slightly zigzag flower-head axis (rachis), up to 1.5 cm. (⅝ in.) long.

Outer flower bract (lemma)—hairy or only harsh, pointed at tip or short-bristly-pointed (awned), about 1 cm. (⅜ in.) long.

Lowest (2) spikelet bracts (glumes)—lance-shaped, sharp or awn-pointed; smooth to slightly hairy; first glume narrow, about 7 mm. (¼ in.) long, 3- to 5-nerved; second glume broader, longer, 5- to 7-nerved.

Leaves—narrow, 3 mm. wide, 5 to 25 cm. (2 to 10 in.) long, sometimes flat but mostly inrolling, harsh.

Stalks (culms)—up to 80 cm. (40 in.) high, smooth, slender to stout.

Rootstocks—underground, long-creeping.

Roots—fibrous.

Fig. 2. Diagram showing floral and vegetative characteristics.

ovary wall. The fruit is, therefore, indehiscent and known as a grain; the stamen consists of a two-celled anther borne on a slender filament. Each flower is borne in the axil of a small green bract, the lemma, and is enveloped in a smaller inner bract, the palea. The flower with its lemma and palea is termed the floret. The florets, like the leaves are borne in two ranks upon a small axis, the rachilla. Below the florets are two bracts without flowers, the glumes. The glumes, rachilla, and florets are collectively termed the spikelets (Figs. 1 and 2).

In bromes and bluegrasses the spikelets are on pedicels (short stems) on the branches of a panicle. In some grasses, such as timothy, the panicle branches and the pedicels are so short that the inflorescence more nearly resembles a spike. In wheatgrasses and in the wild-ryes the spikelets are sessile (without a pedicel), on opposite sides of a simple axis but at different nodes, forming a spike. Somewhat intermediate between a panicle and a spike is a type of inflorescence in which the flowers are borne along an axis on short pedicels of nearly equal length, forming a raceme.

A spikelet in general is a series of scales or bracts alternating along an axis. Grass spikelets differ from spikelets of other plant families in having nothing developing in the axil of the lowest two of these scales. These empty scales are termed glumes in modern taxonomy of grasses. They are also called empty scales, emphasizing the point that nothing occurs in their axils. The great majority of grasses have two glumes, the first developing away from the central axis of the inflorescence and the second on the side toward the central axis. The glumes vary in size and shape, and in relative proportions. Their structure often provides important points in separating certain grasses from others.

Coming from the same axis, but above or outward from the glumes, is a series of scales. The scales are known as lemmas or flowering glumes; the number of lemmas will vary with different grasses from one or two up to, in extreme cases, seventy-two. These vary in shape, hairiness, and the number of veins, and are used in classification. They may have an apex prolonged into an awn. Awns may be present on the glumes and palea as well. Awns vary in length, may be bent or twisted, and in some cases forked. In the axil of a lemma, one expects to find a branch axis. On it another scale develops. This scale is most frequently two-ridged on the back and fits into the lemma as one " V " fits into another. This scale is known as the palea. It immediately encloses the actual flower parts of the grass.

Ordinary sepals and petals are wanting, but two, rarely three, scales, known as lodicules, are present at the base of the flower. They are not usually seen and will ordinarily never be seen unless a person carefully dissects the grass spikelet. By their swelling the grass spikelet is pushed open and the anthers and stigmas have a chance to extrude. It is probable that the lodicules represent the remnants of the perianth in grasses.

Grass flowers may be perfect, in which case both stamens and pistils are present. They may be imperfect, either staminate or pistillate, or they may be rudimentary. In the latter case the branch of the axis, with some of the parts, but not the stamens and pistils, are present. A given spikelet may have various combinations of these characteristics; that is, a spikelet may have two perfect and one imperfect and one rudimentary flower, or it may have a perfect and an imperfect flower, etc. The stamens and pistils may in some cases be borne in separate parts of the inflorescence, as in corn, where the staminate flowers are in the tassels and the pistillate flowers in the ears, or the staminate and pistillate flowers may occur on entirely different plants as in saltgrass (*Distichlis*).

The flowers have to do with perpetuating the species; however, in many cases this is also done by means of rhizomes, which are merely specialized underground stems.

The root, stem, and leaves constitute the vegetative parts of the plant, and are concerned primarily with the life of the individual plant.

In grasses, specialization takes place mostly in the spikelet. The vegetative characters of a given plant show it to be a grass, but it is the spikelets and their arrangement which indicate what kind of grass it is. The genera of grasses and the groups of genera called tribes are based on the structure of the spikelets and their arrangement in the inflorescence.

A spikelet consists of glumes and florets, in two ranks and alternate on the rachilla (*see* Fig. 1); the florets consist of lemma, palea, and enclosed flower. Every organ found in the most highly specialized spikelet is to be interpreted as an elaboration or reduction of one of these parts. The spikelet is the unit of the inflorescence; the floret is the unit of the spikelet. The spikelet is always simple; that is, the rachilla never branches. The floret is always one-flowered with never more than one lemma and one palea. The glumes and florets are always alternate, two consecutive ones never being borne one above the other.

With the above facts in mind, and with an occasional look at Figs. 1 and 2, and at the glossary, the " keying out " of grasses of British Columbia will become relatively simple.

There is sometimes confusion in distinguishing grasses from grass-like plants. A simple key for separating the closely related families is as follows:—

1. Perianth segments rudimentary or degenerate.
   Leaves two-ranked, culms usually hollow .... GRAMINEÆ (the true grasses)
   Leaves three-ranked, culms usually solid .... CYPERACEÆ (the sedges)
2. Perianth present as two distinct whorls .... JUNCACEÆ (the rushes)

Hitchcock's *Manual of the Grasses of the United States* has been used frequently in the compiling of this handbook. The genera of the grasses, however, are arranged alphabetically in this handbook and are numbered to facilitate reference.

One of the prime purposes of a handbook of this type is to stimulate interest in the collecting and identification of plants—in this case, grasses.

Outside of the settled areas our knowledge of the British Columbia flora is still far from complete, particularly at the higher altitudes. Hence there is unlimited opportunity for the amateur collector to obtain material that could be of great value to any of the several herbariums in the Province.

The intelligent collector selects the specimens that he will take with considerable care. Promiscuous and careless snatching of material is wholly unscientific and is likely to lead to many disappointments. As a rule it is wise to take more than one specimen, unless the one selected is especially representative and complete. Often it is impossible to identify a plant accurately on the basis of a single specimen, and it is often desirable to secure several specimens in order to illustrate certain variations of the plant in question.

Each grass specimen should be as complete as possible; that is, it should show enough of the roots, rhizomes or stolons, culms, spikelets, and seeds to ensure unquestionable identification.

The next step in obtaining a good specimen is pressing it. The specimen should be freed of all foreign matter, such as other plants, soil, etc. The leaves should be untangled and flattened and the plant made to look as natural as possible. After that the plants are trimmed to fit the drying-sheets. The plant is now ready to be pressed.

The drying-sheets are then placed between corrugated cardboard and put in a press. The press can be made of two pieces of plywood (12 by 18 inches). These are placed on either side of the plants and tied together as tightly as possible with two straps or belts.

Comprehensive notes made at the time of collection are also invaluable when the plants are finally being mounted and incorporated into a herbarium. These notes should include the name of the plant when known, the date collected, the place collected, the name of the collector, and the elevation. Some people also take notes on habitat, abundance, etc. It is safe to say that too many notes cannot be taken.

It should be noted that this handbook cannot possibly include all the grasses of British Columbia as the study of the group has been somewhat neglected and as much of the Province is relatively unknown botanically. Many grasses that are now listed as occurring in Alaska and the Yukon will undoubtedly be found also in British Columbia as further collecting is carried on, particularly in the northern half of the Province. In the meantime it is hoped that this booklet will stimulate more interest in the group of plants by encouraging the study and collection of grasses by people who may have passed them by in favour of the more showy individuals of the plant kingdom.

IDENTIFICATION OF GRASSES

In seeking to determine the name of a grass, reference may be made to detailed descriptions, drawings, or photographs. However, this laborious method is usually replaced by special helps known as keys. A key is merely a simple means of following through sets of contrasting characters until one comes to a single group. In following through a key, one starts with the lines closest to the margin on the left, reading the characteristics of each group, and then looking at the plant to see which group it fits, e.g.:—

Plants annual.
Plants perennial.
Or Creeping rhizomes present.
Creeping rhizomes absent.

Making the decision leaves the other group entirely out of consideration. Now the same procedure is followed again within the original group selected. This is continued until the name of the grass in question is found.

After finding the name of the plant in the key, one should check the identification by reading over the description. If this agrees then the plant has been run through the key correctly. If there are great discrepancies, one should start over and, if possible, discover the error.

The grasses are first divided, by a key, into two sub-families, namely, FESTUCOIDEÆ and PANICOIDEÆ. After determining the sub-family, the tribe to which the grass in hand belongs is then determined. The tribes listed are only those that contain representatives in British Columbia. The genus can then be determined by referring to the key to the genera of the tribe previously decided upon. It will be noted that a number occurs in front of each genus. This refers to the genus as it occurs in the text. All of the genera are listed alphabetically to facilitate use of the book.

In some cases it will be noted that there are two or more scientific names for the same plant. The most recent acceptable name is the first one in the centre of the page; the synonomy is listed below on the left-hand side of the page.

The two more or less artificial sub-families into which grasses are divided may be compared as in the following table.

COMPARISON OF SUB-FAMILIES OF GRASSES

I. FESTUCOIDEÆ	II. PANICOIDEÆ
1. Spikelets 1 to several flowered, the sterile florets, if any, usually above the fertile florets in the spikelet.	1. Spikelets with one perfect terminal floret below it.
2. Articulation usually above the glumes.	2. Articulation usually below the glumes.
3. Spikelets usually more or less laterally compressed.	3. Spikelets dorsally compressed.

KEYS TO THE TRIBE AND GENERA OF GRASSES

KEY TO THE TRIBES

I. FESTUCOIDEÆ

Spikelets with 2 staminate, neuter, or rudimentary lemmas unlike and below the fertile lemma; no sterile or rudimentary florets above 1. *Phalarideæ*

Spikelets without sterile lemmas below the perfect floret.

Spikelets articulate below the glumes, 1-flowered, very flat, the lemma and palea about equal, both keeled; glumes small or wanting .... 2. *Oryzeæ*

Spikelets articulate above the glumes, rarely below, but the glumes, at least one well developed.

Spikelets sessile or subsessile.

Spikelets alternating on 2 sides of a continuous or jointed rachis .... 3. *Hordeæ*

Spikelets on one side of a continuous rachis .... 4. *Chlorideæ*

Spikelets pedicillate in open or contracted panicles.

Spikelets 1-flowered .... 5. *Agrostideæ*

Spikelets 2- to many-flowered.

Glumes as long as the lowest floret, usually as long as the spikelet; lemmas awned from the back .... 6. *Aveneæ*

Glumes shorter than the first floret; lemmas awnless or awned from the tip or from a bifid apex .... 7. *Festuceæ*

II. PANICOIDEÆ

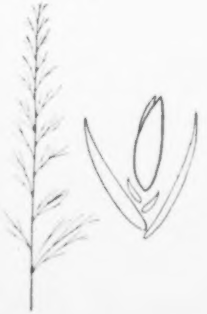
Glumes membranaceous, the sterile lemma like the glumes in texture .... 8. *Paniceæ*

Glumes indurate; fertile lemma and palea membranaceous.

Spikelets unisexual, the pistillate below the staminate above, in the same inflorescence or in separate inflorescence .... 9. *Tripsaceæ*

Spikelets in pairs, one sessile and perfect, the other pedicillate and usually staminate .... 10. *Andropogoneæ*

Tribe 1. *Phalarideæ* (Canary Grass Tribe)



Spikelets with one perfect floret and two sterile florets below, these falling attached to the fertile floret.

Inflorescence a panicle.

(Contains canary grass and sweet vernalgrass.)

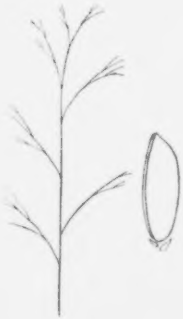
KEY TO THE GENERA OF PHALARIDEÆ

Lower florets staminate: spikelets brown, shining .... 31. *Hierochloe*

Lower florets neuter; spikelets green or yellowish.

- Lower florets consisting of awned hairy sterile lemmas exceeding the fertile floret .... 7. *Anthoxanthum*
- Lower florets reduced to small awnless scalelike lemmas, much smaller than the fertile floret .... 41. *Phalaris*

Tribe 2. *Oryzeæ* (Rice Tribe)



Spikelets 1-flowered, falling from the pedicel entire.

Glumes reduced or suppressed.

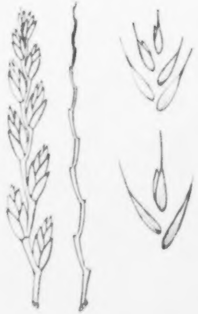
Inflorescence a panicle.

(Contains rice.)

KEY TO THE GENERA OF ORYZEÆ

This tribe is represented in British Columbia by only one genus ... 35. *Leersia*

Tribe 3. *Hordeæ* (Barley Tribe)



Spikelets 1- to many-flowered, sessile on opposite sides of a jointed rachis, forming a spike.

Rachis rather than spikelets specialized.

Inflorescence a solitary spike.

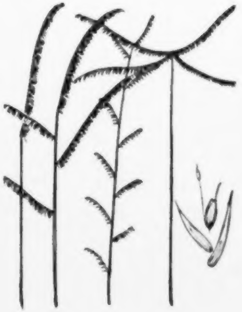
(Contains wheat, rye, and barley.)

Key to the Genera of Hordeæ

Spikelets solitary at each node of the rachis.
- Spikelets placed edgewise to the rachis .... 36. *Lolium*
- Spikelets placed flutewise to the rachis.
  - Plants perennial .... 1. *Agropyron*
  - Plants annual.
    - Glumes ovate 3-nerved (wheat) .... 58. *Triticum*
    - Glumes subulate, 1-nerved (rye) .... 50. *Secale*

Spikelets more than 1 at each node of the rachis.
- Spikelets 3 at each node of the rachis, 1-flowered, the lateral pair pediceled, usually reduced to awns (barley) .... 33. *Hordeum*
- Spikelets 2 at each node of the rachis, alike, 2- to 6-flowered.
  - Rachis continuous .... 28. *Elymus*
  - Rachis disarticulating at maturity glumes extending into long awns .... 52. *Sitanion*

Tribe 4. *Chlorideæ* (Grama Tribe)



Spikelets 1- to several-flowered, sessile on one side of a continuous rachis.

All but the lowest floret commonly sterile and variously modified.

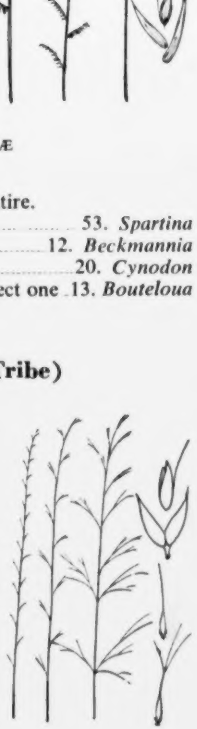
Inflorescence of two to several 1-sided spikes, solitary, racemose or digitate.

(Contains grama grasses.)

Key to the Genera of Chlorideæ

Spikelets without additional modified florets.
  Rachilla articulate below glumes, spikelets falling entire.
    Glumes, unequal, narrow .... 53. *Spartina*
    Glumes equal, broad, boat-shaped .... 12. *Beckmannia*
  Rachilla articulate above the glumes .... 20. *Cynodon*
Spikelets with 1 or more modified florets above the perfect one .. 13. *Bouteloua*

Tribe 5. *Agrostideæ* (Timothy Tribe)



Like Festuceæ reduced to its lowest terms; spikelets 1-flowered.

Lemmas awnless or awned, the awn from back or summit.

Glumes sometimes awned, sometimes suppressed.

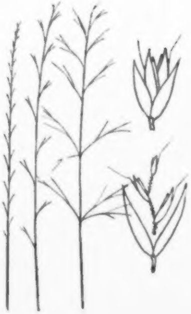
Inflorescence a panicle.

(Contains redtop and timothy.)

Key to the Genera of Agrostideæ

- Articulation below the glumes.
  - Glumes long awned .... 46. *Polypogon*
  - Glumes awned.
    - Rachilla not prolonged behind the palea, panicle dense ... 4. *Alopecurus*
    - Rachilla prolonged behind the palea; panicle open .... 18. *Cinna*
- Articulation above the glumes.
  - Fruit indurate, terete, awned, the nerves obscure, callus well developed.
    - Awn tifid .... 9. *Aristida*
    - Awn simple.
      - Edge of lemma overlapping, callus sharp pointed .... 56. *Stipa*
      - Edges of lemma not meeting, callus short, acutish .... 39. *Oryzopsis*
  - Fruit thin and firm but not indurate, callus not well developed.
    - Lemma firm, subindurate at maturity, bearing a long delicate straight awn just below the tip; palea about as long as the lemma, the naked rachilla produced back of the palea .... 8. *Apera*
    - Lemma thin or membranaceous.
  - Glumes longer than the lemma.
    - Glumes compressed-carinate, stiff-ciliate on the keel; panicle dense, cylindric or ellipsoid .... 42. *Phleum*
    - Glumes not compressed-carinate, not ciliate.
      - Floret bearing a tuft of hairs at the base, from a short callus .... 16. *Calamagrostis*
      - Florets without hairs at the base or with short hairs .... 2. *Agrostis*
  - Glumes not longer than the lemma.
    - Lemma awned from the tip or mucronate .... 38. *Muhlenbergia*
    - Lemma awnless or awned from the back.
      - Floret bearing a tuft of hairs at the base, from a short callus.
        - Panicle spikelike; rachilla prolonged .... 5. *Ammophila*
        - Panicle open; rachilla not prolonged .... 17. *Calamovilfa*
      - Floret without hairs at base.
        - Caryopsis at maturity falling from the lemma and palea; seed loose in the pericarp .... 55. *Sporobolus*
        - Caryopsis not falling from the lemma and palea; remaining permanently enclosed in them .... 38. *Muhlenbergia*

Tribe 6. *Aveneæ* (Oat Tribe)



Like Festuceæ, but glumes enlarged and florets fewer in number.

Rachilla joints short.

Lemmas awned from the back.

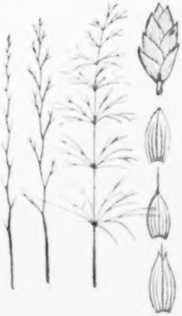
Inflorescence a panicle.

(Contains oats.)

KEY TO THE GENERA OF AVENEÆ

Florets 2, one perfect, the other staminate.
  Lower floret staminate, the awn twisted, geniculate, exserted .... 10. *Arrhentherum*
  Lower floret perfect, awnless; upper floret awned .... 32. *Holcus*
Florets 2 or more, all alike except the reduced upper ones.
  Articulation below the glumes.
    Lemma, at least the upper, with a conspicuous bent awn ... 57. *Trisetum*
    Lemmas awnless or the upper, with a short awn .... 54. *Sphenopholis*
  Articulation above the glumes.
    Lemmas bifid at the apex, awned or mucronate between the lobes .... 23. *Danthonia*
    Lemmas toothed, but not bifid and awned.
      Glumes 2 or 3½ cm. long, 7 to 9 nerved spikelets pendulous, annual (oats) .... 11. *Avena*
      Glumes not more than 1 cm. long, 1 to 5 nerved spikelets not pendulous.
    Lemmas keeled, the awn, when present, from above the middle.
      Rachilla joints very short, glabrous or minutely pubescent, lemmas awnless, or with a straight awn from a toothed apex ... 34. *Koeleria*
      Rachilla joints slender, villous, lemmas with a dorsal bent awn .... 57. *Trisetum*
    Lemmas convex, awned from below the middle.
      Rachilla prolonged behind the upper floret.
        Awn slender, not jointed .... 24. *Deschampsia*
        Awn clavate, jointed near the middle .... 19. *Corynephorus*
      Rachilla not prolonged, lemmas tapering into two slender teeth .... 3. *Aira*

Tribe 7. *Festuceæ* (Fescue Tribe)



Spikelets many-flowered.

Glumes relatively small.

Lemmas awned from summit or awnless.

Inflorescence a panicle.

(Contains fescues, brome grass, and bluegrass.)

KEY TO THE GENERA OF FESTUCEÆ

Tall stout reed with large plume-like panicle .... 43. *Phragmites*
 Low grasses, rarely over 1½ m. tall.
  Plants diœcious, perennial .... 26. *Distichlis*
  Plants not diœcious.
   Spikelets of two forms, sterile and fertile intermixed, panicle dense, somewhat one-sided .... 21. *Cynosurus*
   Spikelets all the same in the same inflorescence.
    Lemmas 5- to many-nerved, the nerves sometimes obscure, lemmas as broad as long, the margins outspread, florets horizontally spreading .... 14. *Briza*
    Lemmas longer than broad, florets not horizontally spreading.
     Callus of florets bearded.
      Lemmas erose at summit, awnless .... 49. *Scolochloa*
      Lemmas bifid at summit, awned .... 48. *Schizachne*
     Callus not bearded (lemmas cob-webby at base of Poa).
      Lemmas keeled on the back.
       Spikelets strongly compressed, crowded in 1-sided clusters, at the end of the stiff, naked panicle branches .... 22. *Dactylis*
       Spikelets not strongly compressed, not crowded in 1-sided clusters.
        Lemmas awned from a minutely bifid apex; spikelets large .... 15. *Bromus*
        Lemmas awnless; spikelets small .... 45. *Poa*
      Lemmas rounded on the back.
       Glumes papery; lemmas firm, strongly nerved, scarious-margined, spikelets tawny or purplish .... 37. *Melica*
       Glumes not papery; upper florets not unlike the others.

Nerves of lemma parallel.
Spikelets in racemes .... 44. *Pleuropogon*
Spikelets in open or contracted panicles.
Nerves prominent; plants usually rather tall, growing in wet marshes .... 30. *Glyceria*
Nerves faint; plants low, growing in saline soil .... 47. *Puccinellia*
Nerves of lemma converging toward the summit.
Lemmas awned or awn tipped from a minutely bifid apex .... 15. *Bromus*
Lemmas entire, pointed, awnless or awned from the tip.
Spikelets awned, lemmas pointed .... 29. *Festuca*
Spikelets awnless .... 45. *Poa*

Tribe 8. *Paniceæ* (Millet Tribe)

Spikelets with one perfect terminal floret and a sterile floret below.

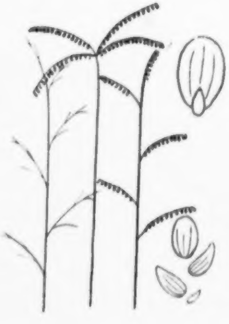
Rachilla joints very short.

Glumes membranaceous, the first small, suppressed in some genera; sterile lemma like the second glume, the two appearing like a pair of glumes.

Fertile lemma and palea indurate.

Inflorescence a panicle or of one to many racemes, these digitate or racemose on the main axis.

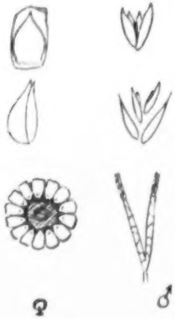
(Contains millets and crab-grasses.)



Key to the Genera of Paniceæ

Spikelets surrounded by 1 to many distinct or more or less connate bristles, forming an involucre .... 51. *Setaria*
Spikelets not subtended bristles.
Glumes or sterile lemma awned or awn pointed .... 27. *Echinochloa*
Glumes and sterile lemma awnless.
Fruit cartilaginous—indurate, flexible, usually dark coloured .... 25. *Digitaria*
Fruit chartaceous—indurate, rigid .... 40. *Panicum*

Tribe 9. *Tripsaceæ* (Corn Tribe)



Plants monœcious.

Pistillate spikelets with one perfect terminal floret and a sterile lemma below, falling embedded in the joints of the rachis. Persistent on the thick compound axis in Zea.

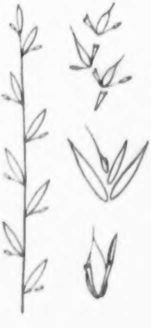
Staminate spikelets 2-flowered in pairs, racemose.

(Contains grama grass and Indian corn.)

Key to the Genera of Tripsaceæ

This tribe is represented in British Columbia by only one genus, 59. *Zea*, which is our garden corn.

Tribe 10. *Andropogoneæ* (Sorghum Tribe)



Spikelets paired, one perfect sessile, the other sterile and pedicellate, borne on a jointed rachis.

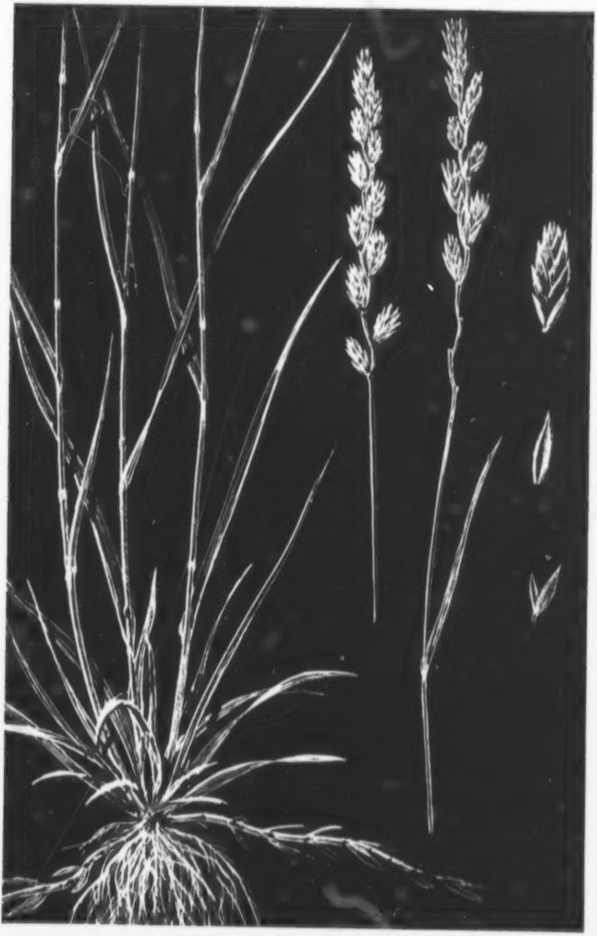
Fertile spikelets with one perfect terminal floret and a sterile pediceled spikelet attached.

Glumes indurate, enclosing the florets; lemmas very thin; palea often suppressed.

(Contains sugarcane and broomsedges.)

Key to the Genera

This tribe is represented in British Columbia by only one genus, 6. *Andropogon*.



Agropyron dasystachyum. Plant, ×⅓; spikelets and floret, ×1.

DESCRIPTIONS OF BRITISH COLUMBIA GRASSES

1. *Agropyron* Gaertn. Wheatgrass

All our species perennial, often with creeping rhizomes, usually with erect culms and green or purplish, usually erect spikes. Spikelets several-flowered, solitary (rarely in pairs), sessile, placed flatwise at each joint of a continuous (rarely disarticulating) rachis the rachilla disarticulating above the glumes and between the florets, glumes equal, firm, several-nerved, usually shorter than the first lemma, acute or awned, rarely obtuse or notched; lemmas convex on the back, rather firm, 5- to 7-nerved, acute or awned from apex, palea about as long as lemma.

Most of the species of *Agropyron* furnish forage and a few are valuable range grasses. In some localities a few may grow in sufficient abundance to produce high-quality hay if put up at the proper time.

Key to the Species of Agropyron

Plants with rhizomes.
Glumes rigid, tapering to short straight awn .... 1. *A. smithii*
Glumes lax, acute or abruptly awn-pointed.
Lemmas glabrous.
Blades lax, flat .... 2. *A. repens*
Blades firm, stiff, often involute .... 3. *A. riparium*
Lemmas pubescent.
Spikes 6 to 12 cm. long; spikelets 1 to 1.5 cm. long; glumes 6 to 9 mm. long .... 4. *A. dasystachyum*
Spikes as much as 25 cm. long; spikelets as much as 2.5 cm. long; glumes to 13 mm. long .... 5. *A. elmeri*
Plants without rhizomes.
Spikelets much compressed, closely imbricate, divergent 6. *A. desertorum*
Spikelets not compressed or imbricate.
Spikelets awnless or awn-tipped only.
Glumes 2 to 2.5 mm. wide, nearly as long as spikelets, rachilla villous.
Glumes with a broad subhyaline margin, unsymmetrical at the summit; lemmas commonly pubescent; spike rather more than 7 cm. long, the spikelets closely imbricate .... 7. *A. latiglume*
Glumes not thin-margined; lemmas glabrous, spike 10 to 25 cm. long, the spikelets mostly, scarcely, or slightly imbricate .... 8. *A. trachycaulum*
Glumes narrower, much shorter than the spikelet, rachilla scaberulous, blades involute .... 9. *A. inerme*

Spikelets awned.
  Rachis continuous, awn straight or nearly so ...... 10. *A. subsecundum*
  Rachis continuous, awn divergent when dry .... 11. *A. spicatum*

1. *Agropyron smithii* Rydb. Western Wheatgrass, Bluestem

Agropyron occidentalis Scribn.

Habit: Perennial with creeping rhizomes.

Culms: Erect, 30 to 60 cm. tall, usually glaucous.

Sheaths: Glabrous.

Blades: Firm, stiff, mostly flat when fresh, involute in drying, strongly nerved, scabrous or sometimes sparsely villous on the upper surface, mostly 2 to 4 mm. wide, tapering to a sharp point.

Inflorescence: An erect spike, mostly 7 to 15 cm. long, the rachis scabrous on the angles.

Spikelets: Rather closely imbricate, occasionally 2 at a node, 6- to 10-flowered, 1 to 2 cm. long, the rachilla scabrous or scabrous-pubescent.

Glumes: Rigid, tapering to a short awn, rather faintly nerved, 10 to 12 mm. long.

Lemmas: About 1 cm. long, firm, glabrous, often pubescent near the base, obscurely nerved, acuminate, mucronate, sometimes short-awned; palea scabrous-pubescent on the keels.

Distribution: Moist, usually alkaline soil, Ontario to British Columbia, and over most of the United States with the exception of the eastern seaboard.

Distribution in British Columbia: Common in the drybelt.

Remarks: A recognized variety is *A. smithii* var. *molle* (Scribn. & Smith) Jones. Lemmas and sometimes glumes more or less pubescent. About the same range as the species.

2. *Agropyron repens* (L.) Beauv. Quackgrass

Habit: Perennial with creeping rhizomes.

Culms: Erect or curved at base, 50 to 100 cm. tall, glaucous.

Sheaths: Sheaths of the innovations often pubescent.

Blades: Relatively thin, flat, usually sparsely pilose on the upper surface, mostly 6 to 10 mm. wide.

Inflorescence: A spike, 5 to 15 cm. long, the rachis scabrous on the angles.

Spikelets: Mostly 4- to 6-flowered, 1 to 1.5 cm. long, the rachilla glabrous or scaberulous.

Glumes: 3- to 7-nerved, awn-pointed.

Lemmas: Mostly 8 to 10 mm. long, the awn from less than 1 mm. to as long as the lemma; palea obtuse, nearly as long as the lemma, scabrous on the keels.

Distribution: Waste places, meadows, and pastures, Newfoundland to British Columbia, and over all of the northern United States.

Distribution in British Columbia: Widely distributed over British Columbia.
Remarks: Can be an extremely troublesome weed in cultivated ground.

3. *Agropyron riparium* Scribn. & Smith. Streambank Wheatgrass

Habit: Perennial with vigorous rhizomes.
Culms: Light green and more or less glaucous, 50 to 100 cm. tall.
Sheaths: Glabrous.
Blades: Stiff, 1 to 3 mm. wide, involute or sometimes flat, scabrous above, glabrous beneath.
Inflorescence: A narrow spike, 5 to 15 cm. long.
Spikelets: Distant, 3- to 5-flowered, 10 to 15 mm. long.
Glumes: Lanceolate, acute, 5 to 8 mm. long, not prominently nerved.
Lemmas: Glabrous or somewhat pubescent along the edges of the lower part of the lemma.
Distribution: Dry or moist meadows or hills, North Dakota to British Columbia, south to Washington and Colorado.
Distribution in British Columbia: Between Elko and Frank.

4. *Agropyron dasystachyum* (Hook.) Scribn.
Thick Spike Wheatgrass

Habit: Perennial with creeping rhizomes.
Culms: Often glacous, mostly 40 to 80 cm. tall.
Blades: Flat to involute, 1 to 3 mm. wide.
Inflorescence: A spike, mostly 6 to 12 cm. long.
Spikelets: Loosely to closely imbricate, 4- to 8-flowered, 1 to 1.5 cm. long, the rachilla pubescent on the convex side.
Glumes: Acute or awn-pointed, scabrous or pubescent, 6 to 9 mm. long.
Lemmas: Densely to sparsely pubescent, sometimes nearly glabrous, awnless or mucronate, about 1 cm. long; palea about as long as the lemma, obtuse.
Distribution: Plains and sandy shores, Michigan to British Columbia, south to Illinois, Colorado, and Oregon.
Distribution in British Columbia: Merritt, Canal Flats, and Columbia Valley.
Remarks: Similar to *A. smithii* var. *molle* ex.

5. *Agropyron elmeri* Scribn.

Habit: Perennial with creeping rhizomes.
Culms: Stiff, erect, 60 to 120 cm. high, glabrous.
Sheaths: Glabrous.
Blades: Stiff, 3 to 8 mm. wide, flat or partly involute, glabrous beneath, scabrous above.
Inflorescence: A spike, 15 to 30 cm. long, sometimes nodding, occasionally branched.
Spikelets: Not crowded, 1.5 to 2.5 cm. long.

Glumes: Narrow, awn-pointed, scabrous, 1 cm. long.
Lemmas: 12 to 15 mm. long, abruptly awn-pointed, villous or puberulent.
Distribution: Dry or sandy soil, British Columbia to Oregon.
Distribution in British Columbia: Dry or sandy soil.

6. *Agropyron desertorum* (Fisch.) Schult. Desert Wheatgrass

Habit: Tufted perennial.
Culms: Slender, erect or geniculate at base, in dense tufts, 25 to 100 cm. tall.
Sheaths: Glabrous or the lower spreading-hirsute.
Blades: 2 to 4 mm., occasionally to 5 mm. wide.
Inflorescence: A spike, 5 to 9 cm. long, 7 to 11 mm. wide, somewhat bristly, the short-jointed rachis pubescent.
Spikelets: Closely spaced on the rachis, 8 to 12 mm. long, 5- to 7-flowered, somewhat spreading.
Glumes: Firm, glabrous to sparsely ciliate on the keel, abruptly narrow into an awn 2 to 3 mm. long.
Lemma: Firm, glabrous to sparsely ciliate on the keel, narrowed into an awn 2 to 3 mm. long, the lemma about 6 mm. long, the awn commonly slightly bent to one side.
Distribution: Introduced from Russia and grown extensively on the drier parts of the plains.
Distribution in British Columbia: Mainly in the dry belt, where it has been introduced.
Remarks: *Agropyron cristatum* (L.) Gaertn., crested wheatgrass, is very similar to *A. desertorum*, except that the spike is a little shorter; spikelets more widely spreading, the glumes somewhat contorted, gradually tapering into the awns, these curved, 2 to 5 mm. long.

Most of the crested wheatgrass grown in this country is the Fairway strain of *A. cristatum;* only about 5 per cent is *A. desertorum*, as the latter has only recently been licensed for distribution in Canada. The new strain is called Summit.

7. *Agropyron latiglume* (Scribn. & Smith) Rydb.

Habit: Tufted perennial.
Culms: Loosely tufted, curved or geniculate below, 20 to 50 cm. tall.
Blades: Flat, short, 3 to 5 mm. wide, short-hirsute on both surfaces, rarely glabrous or nearly so beneath.
Inflorescence: A spike, mostly 3 to 7 cm. long, rarely longer.
Spikelets: Usually closely imbricate.
Glumes: Broad, flat, thin-margined, unsymmetrical and slightly notched at the summit, awn-tipped.
Lemmas: Commonly appressed-pubescent, awnless or awn-tipped.
Distribution: Alpine meadows, open slopes, mostly at high altitudes, British Columbia south to Colorado, east to Labrador and Montana.

Distribution in British Columbia: The screes of Black Tusk, Garibaldi at about 6,000 feet.

8. *Agropyron trachycaulum* (Link) Malte. Slender Wheatgrass

Agropyron tenerum Vasey.
Agropyron pauciflorum (Schwein.) Hitchc.
Habit: Green or glaucous tufted perennial.
Culms: Erect, 50 to 100 cm. tall.
Sheaths: Glabrous or rarely pubescent.
Blades: Mostly 2 to 4 mm. wide.
Inflorescence: Slender spike, 10 to 25 cm. long, sometimes unilateral.
Spikelets: From rather remote to closely imbricate.
Glumes: Awnless or nearly so.
Lemmas: Awnless or nearly so.
Distribution: Labrador to Alaska, south to West Virginia, Missouri, and California.
Distribution in British Columbia: Vancouver Island, Upper Kootenay Valley, Chilcotin, and Prince George.

9. *Agropyron inerme* (Scribn. & Smith) Rydb. Beardless Wheatgrass

Agropyron spicatum var. *inerme* Heller.
Habit: Green or glaucous tufted perennial.
Culms: Often in large bunches, erect, 60 to 100 cm. tall.
Sheaths: Glabrous.
Blades: Flat to loosely involute, 1 to 2 mm., sometimes to 4 mm. wide, glabrous beneath, pubescent on the upper surface.
Inflorescence: A slender spike, mostly 8 to 15 cm. long, the rachis scaberulous on the angles, the internodes 1 to 2 cm. long, or the lowermost 2.5 cm.
Spikelets: Distant, mostly 6- to 8-flowered, the rachilla joints scaberulous, 1.5 to 2 mm. long.
Glumes: Rather narrow, obtuse to acute, about 4-nerved, usually about half as long as the spikelet, glabrous or scabrous on the nerves.
Lemmas: About 1 cm. long, awnless.
Distribution: Plains and dry hills, British Columbia to Montana, south to Oregon, Utah, and Nebraska.
Distribution in British Columbia: The common "bunch grass" of the Interior.
Remarks: Closely related to *A. spicatum*, but very different in appearance because awnless.

10. *Agropyron subsecundum* (Link) Hitchc. Bearded Wheatgrass

Agropyron unilaterale Cassidy.
Agropyron caninum (L.) Beauv.

Habit: Green or glaucous, tufted perennial.

Culms: Erect, 50 to 100 cm. tall.

Sheaths: Glabrous or rarely pubescent.

Blades: Flat, 3 to 8 mm. wide.

Inflorescence: Spike, erect or slightly nodding, 6 to 15 cm. long, sometimes unilateral from twisting of the spikelets to one side, the rachis scabrous or scabrous-ciliate on the angles, sometimes disarticulating.

Spikelets: Rather closely imbricate, few-flowered, the rachilla villose, the callus or the florets short-pilose.

Glumes: Broad, rather prominently 4- to 7-nerved, nearly as long as the spikelet, tapering into an awn.

Lemmas: Obscurely 5-nerved, the nerves becoming prominent toward the tip, the awn straight or nearly so, usually 1 to 3 cm. long.

Distribution: Moist meadows and open woods, Newfoundland to British Columbia, south to Maryland and California.

Distribution in British Columbia: Kimberley, Cranbrook, Chilcotin, and Quesnel.

11. *Agropyron spicatum* (Pursh.) Scribn. & Smith.
Bluebunch Wheatgrass

Habit: Green or glaucous, tufted perennial.

Culms: Often in large bunches, erect, 60 to 100 cm. tall.

Sheaths: Glabrous.

Blades: Flat to loosely involute, 1 to 4 mm. wide, glabrous beneath, pubescent on the upper surface.

Inflorescence: A slender spike, mostly 8 to 15 cm. long, the rachis scaberulous on the angles, the internodes 1 to 2 cm. long, or the lowermost 2.5 cm.

Spikelets: Distant, not as long (but excluding the awns) as the internodes or slightly longer, mostly 6- to 8-flowered, the rachilla joints scaberulous, 1.5 to 2 mm. long.

Glumes: Rather narrow, obtuse to acute, rarely short-awned, about 4-nerved, usually about half as long as the spikelet, glabrous or scabrous on the nerves.

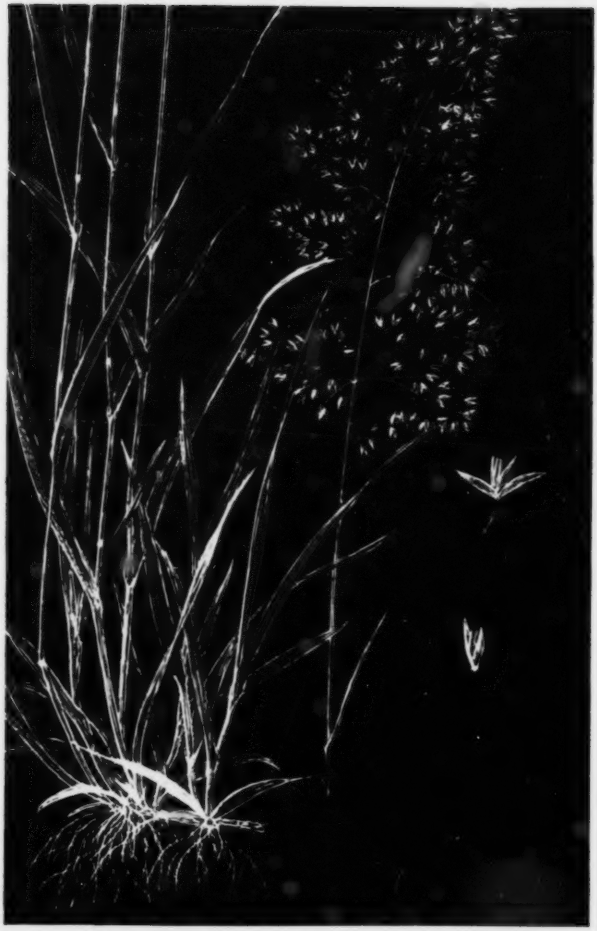
Lemmas: About 1 cm. long, the awn strongly divergent, 1 to 2 cm. long; palea about as long as the lemma, obtuse.

Distribution: Plains, dry slopes, and dry open woods, Michigan to Alaska, south to South Dakota and California.

Distribution in British Columbia: Fairmont Hotsprings and Merritt.

2. *Agrostis* L. Bentgrass

Delicate to moderately tall annuals or usually perennials, with flat or sometimes involute, scabrous blades, and open to contracted panicles of small spikelets. Spikelets 1-flowered, disarticulating



Agrostis alba. Plant, ×⅓; spikelet and floret, ×3.

above the glumes, the rachilla usually not prolonged; glumes equal or nearly so, acute, acuminate, or sometimes awn-pointed, usually scabrous on the keel and sometimes on the back; lemma obtuse, usually shorter and thinner than the glumes, mostly 3-nerved, awnless or dorsally awned, often hairy on the callus; palea usually shorter than the lemma, 2-nerved in only a few species, usually small and nerveless or obsolete.

Most of the species are important forage plants, either under cultivation or in the mountain meadows of the West. The three important cultivated species are redtop, *Agrostis alba,* used for meadows, pastures, lawns, and sports turf, and creeping bent, *A. palustris,* used for lawns and golf-greens. Velvet bent, *A. canina,* is sometimes used for putting greens.

The native species *A. exarata* is abundant enough to be of importance as a forage plant.

KEY TO THE SPECIES OF AGROSTIS

1*a*. Palea evident, 2-nerved, at least half as long as the lemma.
Rachilla prolonged, behind the palea, as a minute bristle.
Spikelets 2 mm. long .... 1. *A. thurberinan*
Spikelets 3 mm. long .... 2. *A. æquivalvis*
Rachilla not prolonged.
Plants tufted; dwarf alpine species .... 3. *A. humilis*
Plants with rhizomes or stolons; taller species of lower and medium altitudes.
Branches of panicle naked at base, the panicle open and delicate; ligule as much as 2 mm. long .... 4. *A. tenuis*
Branches of panicle or some of them floriferous from base; ligule as much as 6 mm. long.
Panicle contracted, branches oppressed; long stolons developed in isolated plants .... 5. *A. palustris*
Panicle open, the branches ascending; no long stolon developed.
Culms decumbent at base, rhizomes wanting .... 6. *A. stolonifera*
Culms erect; rhizomes developed .... 7. *A. alba*

1*b*. Palea obsolete, or a minute nerveless scale.
Plants annual.
Lemma awnless .... 8. *A. rossæ*
Lemma with a slender geniculate or flexuous awn 9. *A. microphylla*
Plants perennial; lemma awned or awnless.
Plants spreading by creeping rhizomes .... 10. *A. pallens*

Plants without rhizomes, stolons sometimes developed.
Panicle narrow, contracted, at least some of the lower branches spikelet-bearing from the base .... 11. *A. exarata*
Panicles open, sometimes diffuse; branches very slender, scabrous, the lower branches not spikelet-bearing at the base.
Panicle very diffuse, the capillary branches branching toward the end .... 12. *A. scabra*
Panicle open but not diffuse, the branches branching at or below the middle.
Lemma awnless (occasional plants with awned lemma).
Spikelets about 2 mm. long; plants of high altitudes, delicate, 10 to 30 cm. tall .... 13. *A. idahoensis*
Spikelets 2 to 3 mm. long, more robust plants of low and medium altitudes .... 14. *A. oregonensis*
Lemma awned .... 15. *A. canina*

1. *Agrostis thurberina* Hitchc. Thurber Bentgrass

Agrostis atrata Rydb.
Habit: Perennial.
Culms: Slender, in small tufts, erect, 20 to 40 cm. tall.
Blades: Leaves somewhat crowded at base, the blades about 2 mm. wide.
Inflorescence: A rather narrow panicle, lax, more or less drooping, 5 to 7 cm. long.
Spikelets: Green, pale, or purple, 2 mm. long.
Glumes: About 2 mm. long, smooth.
Lemmas: Nearly as long as the glumes, the palea about two-thirds as long, rachilla hairy; 0.3 mm. long.
Distribution: Bogs and moist places, at medium and upper altitudes. British Columbia to Wyoming and south to Central California.
Distribution in British Columbia: Vancouver Island, West Vancouver, Monashee Pass, and Mount Revelstoke.

2. *Agrostis æquivalvis* Trin.

Habit: Perennial.
Culms: Slender, erect, 30 to 60 cm. tall.
Blades: Nearly smooth.
Inflorescence: A narrow panicle, 5 to 15 cm. long, often purple. The branches in half whorls.
Spikelets: About 3 to 4.5 mm. long.
Glumes: About 3 mm. long, glabrous on the keel, slightly scabrous near the tip.
Lemmas: Palea nearly as long as the lemma; minutely pubescent, one-fifth to half as long as the lemma.
Distribution: Not common; found in wet meadows and bogs from Alaska southward to California.

Distribution in British Columbia: Not common; Hollyburn Ridge, West Vancouver, at 3,500 feet, and Calvert Island.

3. *Agrostis humilis* Vasey

Habit: Perennial.

Culms: Low, tufted, mostly not more than 15 cm. tall.

Blades: Leaves mostly basal, the blades flat or folded, usually not more than 1 mm. wide.

Inflorescence: A narrow panicle, purple, 1 to 3 cm. long, the branches appressed to somewhat spreading.

Spikelets: About 2 mm. long.

Glumes: 1.5 to 2 mm. long, glabrous.

Lemmas: Nearly as long as the glumes, awnless; palea about two-thirds as long as lemma.

Ligules: 1 mm. long or more.

Distribution: Bogs and alpine meadows with high altitudes. Alaska to Nevada and Oregon.

Distribution in British Columbia: Windermere and Mount Garibaldi.

4. *Agrostis tenuis* Sibth. Colonial Bentgrass

Agrostis vulgaris With.

Habit: Perennial.

Culms: Slender, erect, tufted, usually 20 to 40 cm. tall, with short stolons but no creeping rhizomes.

Blades: Mostly 5 to 10 cm. long, 1 to 3 mm. wide.

Inflorescence: A panicle, mostly 5 to 10 cm. long, open, delicate, the slender branches naked below, the spikelets not crowded.

Spikelets: 2 to 3 mm. long.

Glumes: Scabrous on the midnerve only.

Lemmas: Acute or acutish, 1.5 to 2.5 mm. long; palea about as long as the lemma.

Ligule: Short, less than 1 mm. or on the culm as much as 2 mm. long.

Distribution: Introduced from Europe, common around Vancouver and Victoria; from British Columbia to Montana and California.

Distribution in British Columbia: Common around Vancouver and southeastern Vancouver Island.

Remarks: Cultivated for pastures and lawns. Sometimes called Rhode Island, Colonial, and New Zealand bents.

5. *Agrostis palustris* Huds. Creeping Bentgrass

Agrostis maritima Lam.

Habit: Perennial.

Culms: Ascending from a spreading base, the decumbent portion rooting from long stolons in wet soil, 20 to 50 cm. tall.

Blades: Appressed.

Inflorescence: A panicle, condensed, sometimes somewhat open.
Spikelets: 2 to 2.5 mm. long.
Glumes: Acute, glabrous except the scabrous keel.
Lemmas: Shorter than the glumes, awnless or rarely awned from the back; palea usually half to two-thirds as long as the lemma.
Ligule: As much as 6 mm. long.
Distribution: Marshes along the coast from British Columbia to northern California.
Distribution in British Columbia: Sidney, Manning Park, Nelson, and Lillooet.

6. *Agrostis stolonifera* L.

Habit: Perennial.
Culms: Ascending from a spreading base, the decumbent portion rooting in wet soil, 20 to 50 cm. tall.
Ligule: As much as 6 mm. long.
Blades: Flat, mostly 1 to 3 mm. wide.
Inflorescence: A panicle, oblong, 5 to 15 cm. long, pale or purple, somewhat open, the branches or some of them spikelet-bearing from near the base.
Spikelets: 2 to 2.5 mm. long.
Glumes: Acute, glabrous except the scabrous keel.
Lemmas: Shorter than the glumes, awnless or rarely awned from the back; palea usually half to two-thirds as long as the lemma.
Ligule: As much as 6 mm. long.
Distribution: Moist grassy places from Alaska to Washington.
Distribution in British Columbia: Kaslo, Coal Harbour, and Victoria.
Remarks: Some authorities consider it a native of Europe while others consider that it is indigenous to North America.

7. *Agrostis alba* L. Redtop

Agrostis gigantea Roth.
Habit: Tufted perennial, with strong, creeping rhizomes.
Culms: 1 to 1.5 m. tall, erect from a more or less decumbent base.
Sheaths: Shorter than the internodes.
Blades: 4 to 15 cm. long, 3 to 8 mm. wide, flat, stiff, and upright to lax and spreading scabrous.
Inflorescence: Panicle upright, exerted, 5 to 30 cm. long, with spreading branches, the lower usually verticillate, contracted after flowering, greenish or reddish, the branches slightly rough.
Spikelets: 2 to 2.5 mm. long, numerous, small, 1-flowered, long or short scabrous pedicels, rachilla disarticulating above the glumes, and not prolonged.
Glumes: Persistent, membraneous, scabrous on the keel, acute, awnless, 2 to 3 mm. long, pale or purplish, nearly equal.
Lemmas: Two-thirds to three-fourths as long as the glumes, obtuse, seldom awned, thin-hyaline. Awn, if present, from near the base; palea, one-half to two-thirds as long as its lemma, thin-hyaline.

Ligule: Membranous, 3 to 5 mm. long, fringed.

Distribution: This is the common redtop cultivated for meadows, pastures, and lawns.

Distribution in British Columbia: Escaped from cultivation and found growing in many parts of British Columbia.

Remarks: This form appears not to be native of North America.

8. *Agrostis rossæ* Vasey

Habit: Annual.

Culms: Erect, leafy and branching at base, 10 to 19 cm. tall.

Sheaths: Rather loose.

Blades: Flat, 1 to 2.5 cm. long, 1 to 2 mm. wide.

Inflorescence: A panicle, 3.5 to 6 cm. long, usually contracted, the capillary scabrous purplish branches in relatively distant fascicles, narrowly ascending, naked at base.

Spikelets: 2 to 2.5 mm. long.

Glumes: Acuminate.

Lemmas: 1.5 to 1.6 mm. long, minutely toothed, awnless; palea very minute.

Distribution: Alpine in nature; from British Columbia to Wyoming.

Distribution in British Columbia: Garibaldi, Kokanee, Nelson, McBride, and Manning Park.

9. *Agrostis microphylla* Steud.

Habit: Annual.

Culms: Branching at base, slender, erect or ascending, 8 to 40 cm. tall, commonly short and tall culms in the same tuft.

Blades: 2 to 15 cm. long, rarely longer, 1.5 to 3 mm. wide, scabrous.

Inflorescence: A panicle, mostly 2 to 8 cm. long (exceptionally less or to 10 cm.), narrow, dense, often lobed.

Glumes: Subequal, 3 to 4.4 mm. long, acuminate to awn-tipped.

Lemmas: 1.7 to 1.9 mm. long, minutely toothed, awned from about the middle, the awn geniculate, 3.5 to 6 mm. long, rarely longer; palea wanting.

Distribution: Moist open ground, along the coast, from British Columbia to California.

Distribution in British Columbia: Along the coast region, Burnaby Lake and Nanaimo.

10. *Agrostis pallens* Trin. Dune Bentgrass

Habit: Perennial.

Culms: Erect, 20 to 40 cm. tall; with creeping rhizomes.

Blades: Flat or somewhat involute, 1 to 4 mm. wide.

Inflorescence: A panicle, contracted, almost spike-like, 5 to 10 cm. long.

Glumes: 2.5 to 3 mm. long.

Lemmas: A little shorter than the glumes, awnless; palea, obsolete.
Ligule: Rather firm, 2 to 3 mm. long.
Distribution: Sand dunes along the coast from British Columbia to Washington and Central California.
Distribution in British Columbia: Lulu Island.

11. *Agrostis exarata* Trin. Spike Bentgrass

Agrostis scouleri Trin.
Habit: Perennial.
Culms: 20 to 120 cm. tall, slender to relatively stout, mostly tufted.
Sheaths: Smooth to somewhat scabrous.
Inflorescence: A narrow panicle, from somewhat open to dense and interrupted, 5 to 30 cm. long.
Glumes: Subequal, 2.5 to 4 mm. long, acuminate to awn-tipped, scabrous on the back.
Lemma: 1.7 to 2 mm. long, the midnerve ending above the middle or excurrent as a prickle or short awn, sometimes the nearly straight awn exceeding the glumes; palea minute.
Ligule: 6 mm. long; blades flat, 2 to 10 mm. wide, usually scabrous.
Distribution: Moist open ground, at low and medium altitudes, British Columbia to California and Texas.
Distribution in British Columbia: Vancouver Island, Goose Island, Monashee, Vancouver, and Nelson.
Remarks: A common and extremely variable species, ranging from slender plants with narrow blades and few flowered panicles to robust plants a metre or more tall with dense panicles.

12. *Agrostis scabra* Willd.

Habit: Perennial.
Culms: 30 to 85 cm., rarely to 100 cm. tall, erect in small dense tufts.
Sheaths: Shorter than the internodes, glabrous.
Blades: Flat, 8 to 20 cm. long, 1 to 3 mm. wide, scabrous, the basal ones often subfiliform.
Inflorescence: Panicles, 15 to 25 cm. long, rarely longer, the brittle scabrous branches in rather distant verticils, ascending or spreading, sometimes drooping, branching above the middle.
Spikelets: 2 to 2.7 mm. long, loosely arranged at the ends of the branchlets.
Glumes: Unequal, acuminate, scabrous on the keels.
Lemmas: 1.5 to 1.7 mm. long, distinctly longer than the caryopsis, the callus sparsely pilose, anthers 0.4 to 0.5 mm. long.
Ligules: Hyaline, 2 to 5 mm. long.
Distribution: Meadows and fields and open woods from British Columbia to California.
Distribution in British Columbia: Sandy or wet places throughout British Columbia.

Remarks: The panicle breaks away at maturity, becoming a tumbleweed. *A. hiemalis* now considered an eastern species distinct from *A. scabra*. *A. scabra* var. *geminata* (Trin.) Swallen. Branches of panicle short and divaricate; lemma awned or awnless. The type specimen, from Alaska, is awned; a large number of specimens over a wide range agree in other respects, but are awnless.

13. *Agrostis idahoensis* Nash. Idaho Redtop

Habit: Perennial.
Culms: Slender, tufted, 10 to 30 cm. tall.
Blades: Leaves mostly basal, the blades narrow.
Inflorescence: A loosely spreading panicle, 5 to 10 cm. long, the branches capillary, flexuous, minutely scabrous.
Spikelets: 1.5 to 2.5 mm. long.
Glumes: Very acute, scabrous on the keel, about 2 mm. long.
Lemmas: About 1.3 mm. long, awnless; palea, minute.
Distribution: Mountain meadows at medium and high altitudes, western Montana to British Columbia and Washington.
Distribution in British Columbia: Garibaldi and Victoria.
Remarks: Differs from *A. scabra* in the smaller spikelets and in the narrower panicle with shorter flexuous branches.

14. *Agrostis oregonensis* Vasey. Oregon Redtop

Habit: Perennial.
Culms: 60 to 90 cm. tall.
Blades: 2 to 4 mm. wide.
Inflorescence: An oblong panicle, 10 to 30 cm. long, open, the branches verticillate, rather stiff and ascending, numerous in the lower whorls, the longer 5 to 10 cm. long, branching above the middle.
Glumes: 2.5 to 3 mm. long, the keel slightly scabrous.
Lemmas: 1.5 mm. long, awnless; palea about 0.5 mm. long.
Distribution: Marshes, bogs, and wet meadows, Montana to British Columbia south to California.
Distribution in British Columbia: West coast and Vancouver Island.

15. *Agrostis canina* L. Velvet Bentgrass

Habit: Perennial.
Culms: Tufted, 30 to 50 cm. tall.
Blades: Mostly short and narrow, those of the culm 3 to 6 cm. long, usually not more than 2 mm. wide.
Inflorescence: A loose and spreading panicle, mostly 5 to 10 cm. long.
Glumes: Equal, acute, 2 mm. long, the lower minutely scabrous on the keel.

Lemmas: A little shorter than the glumes, awned about the middle, the awn exserted, bent, callus minutely hairy; palea minute.
Distribution: Meadows and open ground, sometimes used on golf-greens.
Distribution in British Columbia: Sometimes cultivated for putting greens. No specimens available but Henry lists it from Victoria.
Remarks: Possibly native northward but introduced in the eastern United States and around Victoria.

3. *Aira* L.

Delicate annuals with lax, subfiliform blades and open or contracted panicles of small spikelets. Spikelets 2-flowered, disarticulating above the glumes, the rachilla not prolonged; glumes boat-shaped, about equal, 1-nerved or obscurely 3-nerved, acute, membranaceous or subscarious; lemmas firm, rounded on the back, tapering into 2 slender teeth, bearing on the back below the middle a slender geniculate, twisted, usually exserted, awn, this sometimes wanting in the lower floret or reduced; callus minutely bearded.

Weedy grasses of no economic importance, introduced from Europe.

KEY TO THE SPECIES OF AIRA

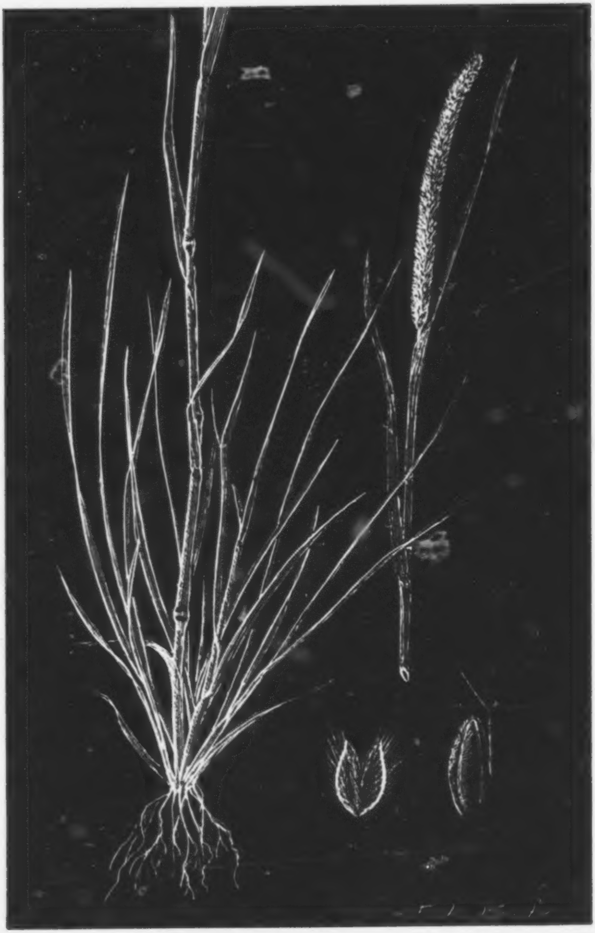
Panicle dense, spike-like .... 1. *A. præcox*
Panicle open .... 2. *A. caryophyllea*

1. *Aira præcox* L. Little Hair-grass

Habit: Annual.
Culms: Tufted, 10 to 20 cm. tall, usually erect.
Sheaths: Slender, 5 to 15 cm. high, erect to depressed-spreading.
Blades: Very short, revolute, scabrous, 1 mm. wide or less.
Inflorescence: A narrow panicle, dense 1 to 3 cm. long.
Spikelets: Yellowish, shining, 3.5 to 4 mm. long.
Glumes: About 3 mm. long, scabrous.
Lemmas: With awns 2 to 4 mm. long, that of the lower floret the shorter.
Distribution: Sandy open ground, along the coast, New Jersey to Virginia; British Columbia to California.
Distribution in British Columbia: Dry fields, Victoria and New Westminster.

2. *Aira caryophyllea* L. Silvery Hair-grass

Habit: Annual.
Culms: Solitary or in small tufts, erect, 10 to 30 cm. tall.
Sheaths: Slender, 6 to 35 cm. high.
Blades: Revolute, 1 mm. wide or less, slightly scabrous.
Inflorescence: An open panicle.



Alopecurus æqualis. Plant, ×2; *A. alpinus* glumes and floret, ×6.

Spikelets: Silvery shining, 3 mm. long, clustered toward the ends of the spreading capillary branches.
Glumes: 2.5 to 3 mm. long, slightly scabrous.
Lemmas: A little shorter than the glumes, scabrous near the tips, those of both flowers bearing a bent dorsal awn about 3 mm. long.
Distribution: Open dry ground, coastal plain, Massachusetts to Florida, Louisiana and Ohio; common on the Pacific coast from British Columbia to California.
Distribution in British Columbia: Vancouver Island and Vancouver.

4. *Alopecurus* L. Foxtail

Spikelets, 1-flowered, disarticulating below the glumes, strongly compressed laterally; glumes equal, usually united at base, ciliate on the keel; lemma about as long as the glumes, 5-nerved, obtuse, the margins united at base, bearing from below the middle a slender dorsal awn, this included or exserted two or three times the length of the spikelet; palea wanting. Low or moderately tall perennials or some annuals, with flat blades and soft, dense, spike-like panicles.

The species of *Alopecurus* are all palatable and nutritious forage grasses, but usually are not found in sufficient abundance to be of great importance. *A. pratensis,* meadow foxtail, is sometimes used as a meadow grass in the eastern United States; *A. æqualis* is the most common on the western ranges.

KEY TO THE SPECIES OF ALOPECURUS

- Spikelets 5 to 6 mm. long. Introduced perennials.
  - Panicle slender, tapering at each end; glumes scabrous on the keel .... 1. *A. myosuroides*
  - Panicle cylindric, dense; glumes conspicuously ciliate on the keel .... 2. *A. pratensis*
- Spikelets 2 to 4 mm. long (rarely 5 mm. in *A. saccatus,* annual). Native species.
  - Plants perennial.
    - Awn scarcely exceeding the glumes .... 3. *A. æqualis*
    - Awn exserted 2 mm. or more.
      - Awn exserted 2 to 3 mm.; panicle 3 to 4 mm. thick; spikelets 2.5 mm. long .... 4. *A. geniculatus*
      - Awn exserted 3 to 5 mm.; panicle 4 to 6 mm. thick; spikelets about 3 mm. long .... 5. *A. pallescens*
  - Plants annual.
    - Spikelets 4 to 5 mm. long; panicle relatively loose .... 6. *A. saccatus*
    - Spikelets 2 to 3.5 mm. long; panicle dense .... 7. *A. carolinianus*

1. *Alopecurus myosuroides* Huds.

Alopecurus agrestis L.

Habit: Perennial.

Culms: Tufted, slightly scabrous, 10 to 50 cm. tall, erect or decumbent at base.

Blades: Usually 2 to 3 mm. wide.

Inflorescence: A slender panicle, somewhat tapering at each end, 4 to 10 cm. long, 3 to 5 mm. wide.

Glumes: 6 mm. long, pointed, whitish with 3 green nerves, glabrous, scabrous on the keel, short ciliate at base.

Lemmas: About as long as the glumes, the awn bent, exserted 5 to 8 mm.

Distribution: Fields, waste places, Maine to North Carolina, British Columbia to California.

Distribution in British Columbia: Only collected from the Experiment Station, Saanichton.

Remarks: Native of Europe, quite rare.

2. *Alopecurus pratensis* L. Meadow Foxtail

Habit: Perennial.

Culms: Erect, 30 to 80 cm. tall.

Blades: 2 to 6 mm. wide.

Inflorescence: A panicle, 3 to 7 cm. long, 7 to 10 mm. thick.

Glumes: 5 mm. long, villous on the keel and pubescent on the sides; awn exserted 2 to 5 mm.

Lemmas: Nearly as long as the glumes, puberulent near the apex.

Distribution: Fields and waste places, British Columbia to Newfoundland, south to Missouri, Montana, and Oregon.

Distribution in British Columbia: Victoria, Clinton, and Nanaimo.

Remarks: Introduced from Europe. Occasionally cultivated as a meadow grass.

3. *Alopecurus æqualis* Sobol. Short-awn Foxtail

Alopecurus aristulatus Michx.

Habit: Perennial, somewhat tufted.

Culms: Erect or spreading, usually not rooting at the nodes, 15 to 60 cm. tall.

Sheaths: Mostly loose or inflated.

Blades: Flat, 1 to 4 mm. wide.

Inflorescence: A slender panicle, 2 to 7 cm. long, about 4 mm. thick.

Spikelets: 2 mm. long; awn of lemma scarcely exserted; anthers about 0.5 mm. long.

Glumes: About 2.5 mm. long, united one-fourth their length or less, long-pubescent especially on the keel and nerves.

Lemmas: Glabrous, about equaling the glumes.

Distribution: In water and wet places, British Columbia to Alaska and Greenland, south to Illinois, Kansas, and California.

Distribution in British Columbia: Vancouver Island, Prince George, Chilcotin, and the Cariboo.

4. *Alopecurus geniculatus* L. Water Foxtail

Habit: Perennial.

Culms: Weak, decumbent or more often creeping below, erect only in dwarfed forms, 30 to 60 cm. long.

Sheaths: Loose or somewhat inflated.

Blades: 2 to 3.5 mm. wide, slightly scabrous above.

Inflorescence: A panicle, 3 to 7 cm. long, 3 to 4 mm. wide.

Glumes: 2.5 to 3 mm. long, dark coloured at tip, pilose on the keel and nerve.

Lemma: Glabrous, a little shorter than the glumes, the often dark-coloured awn bent, exserted twice the length of the glumes.

Distribution: In water and wet places, Newfoundland to British Columbia, south to Kansas, Wyoming, and California.

Distribution in British Columbia: Vancouver Island, Squamish River, and Cariboo.

5. *Alopecurus pallescens* Piper. Washington Foxtail

Habit: Tufted pale-green perennial.

Culms: 30 to 50 cm. tall, erect, or lower nodes geniculate.

Sheaths: Somewhat inflated.

Blades: 2 to 4 mm. wide.

Inflorescence: A pale dense panicle, 2 to 7 cm. long, 4 to 6 mm. thick.

Glumes: About 3 mm. long, ciliate on the keel, appressed-pubescent on the sides.

Lemmas: Awn near the base, the awn exserted 3 to 5 mm.; anthers about 2 mm. long.

Distribution: Edges of ponds and wet places, British Columbia and Montana to Washington and northern California.

Distribution in British Columbia: Frequent along the coast.

6. *Alopecurus saccatus* Vasey

Habit: Annual.

Culms: Erect or geniculate below, 20 to 50 cm. high.

Sheaths: Inflated.

Blades: 2 to 4 mm. wide, scabrous above.

Inflorescence: A panicle, 2 to 4 cm. long, short exserted or partly included.

Spikelets: 4 to 5 mm. long, the awn exserted 5 to 8 mm.; anthers 1 mm. long.

Glumes: 4 to 5 mm. long, united only at base; strongly villose on the keel, less so on the sides.

Lemmas: Often shorter than the glumes, glabrous or sparingly pubescent.
Distribution: Wet places, British Columbia south to California.
Distribution in British Columbia: Listed by Henry as occurring on Vancouver Island and at Yale.

7. *Alopecurus carolinianus* Walt.

Alopecurus macounii Vasey.
Habit: Annual.
Culms: Tufted, much branched at base, 10 to 50 cm. tall.
Sheaths: Moderately inflated.
Blades: 2 to 4 mm. wide, short.
Inflorescence: A panicle, well exserted, dense, 2.5 to 5 cm. long, 2.5 to 3 mm. broad.
Spikelets: 2 to 2.5 mm. long, pale.
Glumes: Long-ciliate on the keel and sparingly appressed-pubescent toward the base; awn exserted 2 to 4 mm.
Distribution: Moist open ground, old fields, and wet places, British Columbia to California and all of the eastern States.
Distribution in British Columbia: Listed by Eastham as occurring in British Columbia. Found by Macoun in Oak Bay, 1885.

5. *Ammophila* Host. Beachgrass

Tough, rather coarse, erect perennials, with hard, scaly, creeping rhizomes, long, tough, involute blades, and pale, dense spikelike panicles. Spikelets 1-flowered, compressed, the rachilla disarticulating above the glumes, produced beyond the palea as a short bristle, hairy above; glumes about equal, chartaceous; lemma similar to and a little shorter than the glumes, the callus bearded; palea nearly as long as the lemma.

Ammophila arenaria (L.) Link. European Beachgrass

Habit: Perennial.
Culms: 50 to 150 cm. tall, with deep, extensively creeping rhizomes.
Sheaths: Broad and overlapping.
Blades: Very long, stiff, revolute, glabrous beneath, densely puberulent above.
Inflorescence: A panicle, often thicker in the middle, tapering to the summit.
Spikelets: 1.2 to 1.5 cm. long.
Glumes: Scabrous on the keel, the first 1-nerved, the second 3-nerved.
Lemmas: Scabrous, the callus hairs about 3 mm. long.
Palea: Nearly equaling the lemmas.

Ligule: Thin, 10 to 30 mm. long, blades elongate, firm, soon involute, tapering to a fine point, upper surface pubescent.

Rachilla: Callus hairs about 3 mm. long, the rachilla 2 mm. long.

Distribution: Beaches and dunes along the coast; more common southward. A valuable sand-binder of European coasts. Introduced for this purpose at Clayoquot, Vancouver Island; apparently spontaneous and established on Sidney Island, Victoria. Introduced from Europe.

6. *Andropogon* L. Beardgrass

Coarse perennials, often purplish, with spikelets paired on a bearded, jointed axis, one member of each pair sessile and fertile, the other sterile and pedicellate, the pair falling together with a joint of the axis, and these racemes aggregated into a digitate inflorescence or scattered along the culm and racemose. Fertile spikelet with a pair of coriaceous glumes which enclose a thin empty lemma and a narrow, hyaline, fertile lemma which often bears a bent awn.

Valuable forage grasses of dry ranges.

Andropogon scoparius Michx. Little Bluestem

Habit: Tufted green or glaucous to purple perennial.

Culms: Tufted, from slender to robust, compressed, 50 to 150 cm. tall, erect, the upper half freely branching.

Sheaths: Commonly glabrous or nearly so, frequently sparsely pilose.

Blades: Glabrous or nearly so, sparsely pilose at the junction of the blade and sheath, rarely pubescent to villose throughout, the blades 3 to 6 mm. wide, flat.

Inflorescence: A raceme, 3 to 6 cm. long, mostly curved, the filiform peduncles mostly wholly or partly included in the sheaths, commonly spreading, the rachis slender, flexuous, pilose, sometimes copiously so.

Spikelets: Sessile, mostly 6 to 8 mm. long, scabrous, the awn 8 to 12 mm. long; pedicellate spikelet usually reduced, short-awned, spreading, the pedicel pilose.

Glumes: Of the fertile (sessile) spikelet subequal, acuminate, the first dorsally flattened, with a strong nerve near each margin, the midnerve faint; the second thinner, keeled above, scabrous on the keel, ciliate on margin.

Lemmas: Sterile lemma nearly as long as the glumes, acuminate. Fertile lemma entire or 2-toothed at the apex, shorter than the sterile lemma, with a twisted awn, 8 to 15 mm. long, bent about 3 mm. from the base.

Distribution: Prairies, plains, open woods, sandhills, Quebec and Maine to British Columbia and Idaho, south to Florida and Arizona.

Distribution in British Columbia: Dry hillside range, Fairmont Hotsprings.
Remarks: A dominant and important grass of the tall-grass prairie.

7. *Anthoxanthum* L. Vernalgrass

Sweet-smelling annuals or perennials, with flat blades and spike-like panicles. Spikelets with 1 terminal perfect floret and 2 sterile lemmas, the rachilla disarticulating above the glumes, the sterile lemmas falling attached to the fertile floret; glumes unequal, acute or mucronate; sterile lemmas shorter than the glumes, empty, awned from the back; fertile lemma shorter than the sterile ones, awnless; palea 1-nerved, rounded on the back, enclosed in the lemma.

KEY TO THE SPECIES OF ANTHOXANTHUM

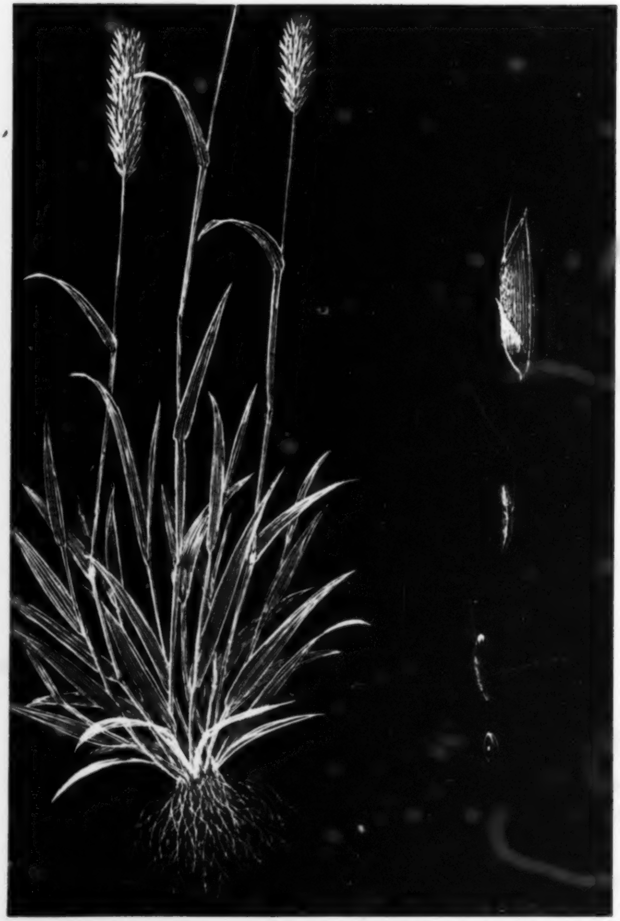
Plants perennial	1. *A. odoratum*
Plants annual	2. *A. aristatum*

1. *Anthoxanthum odoratum*. Sweet Vernalgrass

Habit: Sweet-scented tufted perennial.
Culms: Tufted, erect, slender, 30 to 60 cm. tall.
Sheaths: Glabrous.
Blades: 2 to 5 mm. wide, sparingly pilose on both sides.
Inflorescence: A panicle, long-exserted, brownish yellow, acute, 2 to 6 cm. long.
Spikelets: 8 to 10 mm. long.
Glumes: Scabrous, the first about half as long as the second.
Lemmas: The sterile lemmas subequal, appressed-pilose with golden hairs, the first short-awned below the apex, the second awned from near the base, the awn twisted below, geniculate, slightly exceeding the second glume; fertile lemma about 2 mm. long, brown, smooth and shining.
Distribution: Meadows, pastures, and waste places, Greenland and Newfoundland to Louisiana and Michigan, and on the Pacific coast from British Columbia to California. Introduced from Eurasia.
Distribution in British Columbia: Vancouver Island, Clinton, and Vancouver.

2. *Anthoxanthum aristatum* Boiss

Habit: Annual, usually not densely tufted.
Culms: 10 to 35 cm. high.
Sheaths: Glabrous.
Blades: Narrow, often glabrous below or on both faces.
Inflorescence: A panicle, 1 to 4 cm. long.
Spikelets: 6 to 9 mm. long.



Anthoxanthum odoratum. Plant, × ⅓; spikelet, sterile lemma, and fertile floret, × 3.

Glumes: Narrower and somewhat shorter than *A. odoratum*, pale green.
Lemmas: Sterile lemmas dark brown at the base, awn more than twice as long.
Distribution: Waste places and several localities from Maine to Iowa, West Virginia and Arkansas, Vancouver Island to California. Introduced from Europe.
Distribution in British Columbia: Vancouver Island, Barnston Island, and New Westminster.

8. *Apera* Adans.

Annuals with flat blades and loose or narrow panicles. Spikelets 1-flowered, disarticulating above the glumes, the rachilla prolonged back of the palea as a naked bristle; glumes subequal, acuminate; lemma firm, subindurate at maturity, acute, bearing a long delicate straight awn just below the tip; palea nearly as long as the lemma, strongly 2-nerved.

Apera interrupta (L.) Beauv.

Agrostis interrupta L.
Habit: Annual.
Culms: Branched at the base, mostly 40 to 60 cm. tall.
Blades: Flat, 1 to 3 mm. wide.
Inflorescence: A panicle, 10 to 20 cm. long, usually less than half as broad, condensed, interrupted, the branches of some of them flower-bearing at the base.
Spikelets: 2 to 2.5 mm. long.
Glumes: Somewhat unequal, the first shorter and narrower.
Lemmas: About as long as the second glume, scaberulous, with a slender awn from below the apex, the awn of the lemma about 1 cm. long; palea about as long as the lemma; rachilla less than 0.5 mm. long.
Distribution: Introduced in Missouri, Washington, Oregon, and British Columbia.
Distribution in British Columbia: Lumby and Nanaimo.
Remarks: Introduced from Europe.

9. *Aristida* L. Three-awn

Slender, tufted perennials, in ours, with narrow or convolute blades and narrow bristly panicles. Spikelets 1-flowered, disarticulating above the glumes obliquely so as to produce a bearded, sharp-pointed callus attached to the base of the floret. Glumes unequal, in ours, long and narrow, membranaceous or papery, acute, acuminate, or aristate. Lemma narrow and terete, strongly convolute and indurate around the fruit, with three conspicuous awn-branches from its apex.

Aristida longista Steud., var. *robusta* Merril

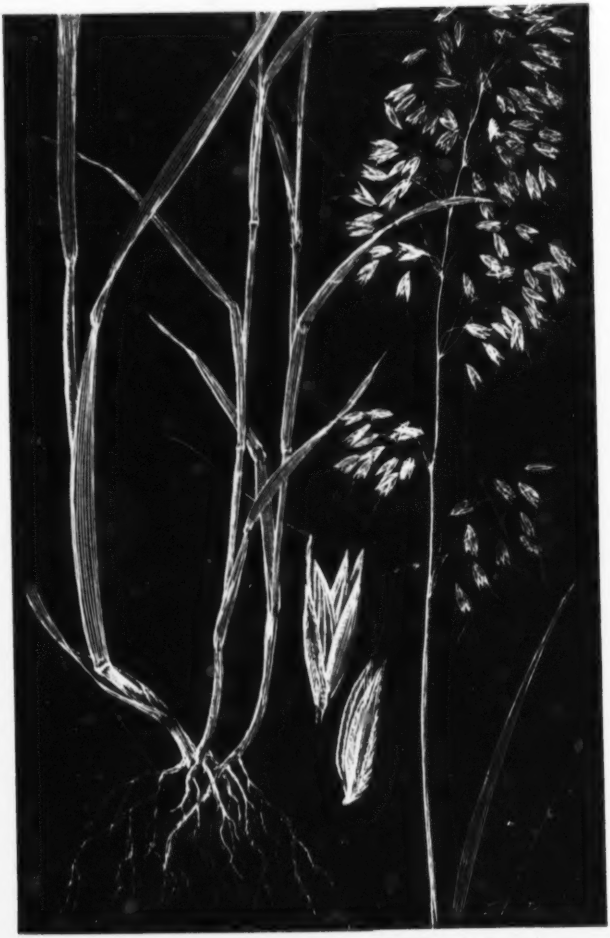
Habit: Tall robust perennial.
Culms: 30 to 50 cm. tall.
Sheaths: Scabrous, hairy at the throat.
Blades: Closely involute, filiform, stiff and very scabrous, often reaching the panicle.
Inflorescence: A panicle, simple, narrow, erect and fairly stiff, few-flowered, the axis only a few cm. long, the branches ascending or appressed, or the lower more or less curved.
Spikelets: Few.
Glumes: Scabrous on the keel, the first about 12 mm. long including the awn-like tip, the second 20 to 30 mm.
Lemmas: Scarcely narrower upward, 12 to 18 mm. long, the awn 5 to 7 cm. long.
Distribution: Plains and foothills, North Dakota and Iowa to Montana and British Columbia, south to Texas, Arizona, and northern Mexico.
Distribution in British Columbia: Summerland, Penticton, Tranquille, and Osoyoos.

10. *Arrhenatherum* Oatgrass

Rather tall perennials, with flat blades and narrow panicles. Spikelets 2-flowered, the lower floret staminate, the upper perfect, the rachilla disarticulating above the glumes and produced beyond the florets; glumes rather broad and papery, the first 1-nerved, the second a little longer than the first and about as long as the spikelets, 3-nerved; lemmas 5-nerved, hairy on the callus, the lower bearing near the base a twisted, geniculate, exserted awn, the upper bearing a short straight slender awn just below the tip.

Arrhenatherum elatius (L.) Tall Oatgrass

Habit: Perennial.
Culms: Erect, 1 to 1.5 m. tall.
Blades: Flat, scabrous, 5 to 10 mm. wide.
Inflorescence: A panicle, pale or purplish, shining, 15 to 30 cm. long, the short branches verticillate, spreading in anthesis, usually spikelet-bearing from the base.
Spikelets: 7 to 8 mm. long.
Glumes: Minutely scabrous.
Lemmas: Scabrous, the awn of the staminate floret about twice as long as its lemma.



Arrhenatherum elatius. Plant, ×¼; spikelet and upper floret, ×2½.

Distribution: Meadows, open ground, and waste places, Newfoundland to British Columbia, south to Georgia, Iowa, and California.
Distribution in British Columbia: Saanich and Mayne Island.
Remarks: Introduced from Europe and escaped from cultivation. Cultivated in northern humid regions as a meadow grass.

11. *Avena* L. Oats

Low or moderately tall annuals, with narrow or open, usually rather few-flowered panicles of large spikelets. Spikelets 2- or 3-flowered, the rachilla bearded, disarticulating above the glumes and between the florets; glumes about equal, membranaceous or papery, 7- to 9-nerved, longer than the lower floret, usually exceeding the upper floret; lemmas indurate, except toward the summit, 5- to 9-nerved, bidentate, bearing a dorsal bent and twisted awn (straight and reduced in *Avena sativa*), the awn in age commonly breaking at the bend.

The most important species of the genus is *A. sativa*, the familiar cultivated oat.

KEY TO THE SPECIES OF AVENA

Spikelets mostly 2-flowered, the florets not readily separating; awn usually straight or wanting; lemmas glabrous .... 1. *A. sativa*

Spikelets mostly 3-flowered, the florets readily separating; awn stout, geniculate, twisted; lemmas clothed with stiff brown hairs (hairs sometimes white or scant) .... 2. *A. fatua*

1. *Avena sativa* L. Oats

Habit: Annual.
Culms: Branching from the base, stout, 30 to 100 cm. tall.
Sheaths: Smooth.
Blades: Scabrous, 5 to 15 mm. wide.
Inflorescence: A lax panicle, many-flowered, with rough, slender, fascicled branches.
Spikelets: 2-flowered.
Glumes: 7- to 11-nerved, about 25 mm. long.
Lemmas: Long remaining attached to the rachilla, glabrous, 15 to 20 mm. long, awnless or with a short straight awn.
Distribution: Wherever coarse grains are grown in North America.
Remarks: This is the commonly cultivated oat, grown mainly for feed.

2. *Avena fatua* L. Wild Oats

Habit: Annual.
Culms: 30 to 75 cm. tall, erect, stout.

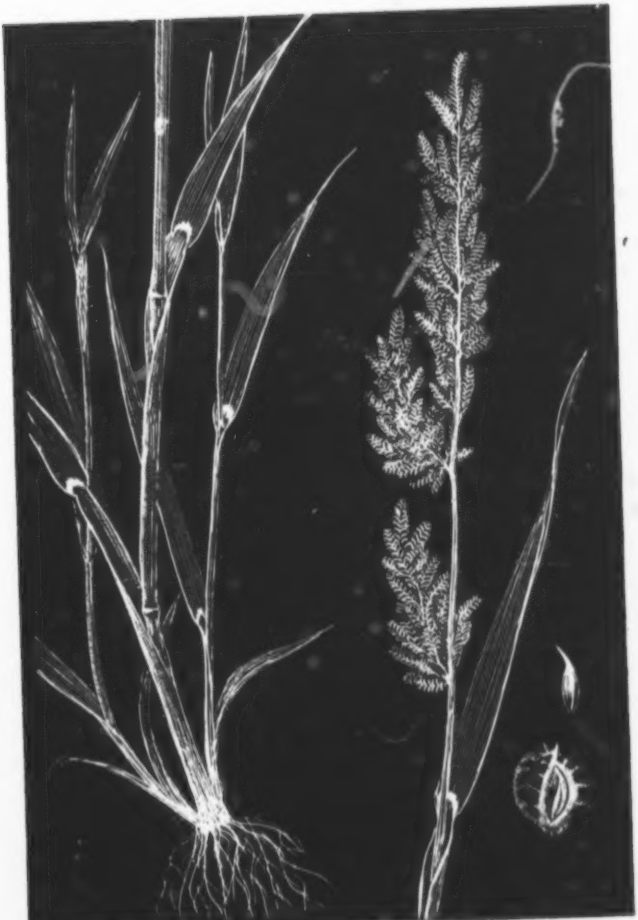
Sheaths: Smooth.
Blades: Flat, usually 4 to 8 mm. wide, scabrous.
Inflorescence: Loose open panicle, the slender branches usually horizontally spreading.
Spikelets: Usually 3-flowered.
Glumes: About 2.5 cm. long; rachilla and lower part of the lemma clothed with long stiff brownish or sometimes whitish hairs, these sometimes scant; florets readily falling from the glumes.
Lemmas: Nerved above, about 2 cm. long, the teeth acuminate, not setaceous; awn stout, geniculate, twisted below, 3 to 4 cm. long.
Distribution: Cultivated soil and waste places; a common weed on the Pacific coast and the wheat-growing Provinces but rare in the eastern States.
Remarks: Introduced from Europe. Seed used for food by the Indians.

12. *Beckmannia* Host. Sloughgrass

Erect, rather stout annuals with flat blades and numerous short appressed or ascending spikes in a narrow more or less interrupted panicle. Spikelets 1- or 2-flowered, laterally compressed, subcircular, nearly sessile and closely imbricate, in 2 rows along one side of a slender continuous rachis, disarticulating below the glumes, falling entire; glumes equal, inflated, obovate, 2-nerved, rounded above but the apex apiculate; lemma narrow, 5-nerved, acuminate, about as long as the glumes; palea nearly as long as the lemma.

Beckmannia syzigachne (Steud.) American Sloughgrass

Beckmannia erucæformis (L.) Host.
Habit: Tall, light green, rather stout annual.
Culms: 30 to 100 cm. tall, glabrous, simple.
Sheaths: Loose, overlapping.
Blades: Scabrous on both sides, 6 to 12 mm. wide.
Inflorescence: A panicle, 10 to 25 cm. long, the erect branches 1 to 5 cm. long; spikes crowded, 1 to 2 cm. long.
Spikelets: 1-flowered, 3 mm. long.
Glumes: Transversely wrinkled and with a deep keel, the acuminate apex of the lemma protruding.
Lemmas: As long as the glume, acute.
Distribution: Wet meadows and ditches throughout most of North America.
Distribution in British Columbia: Prince George, Creston Flats, Cariboo, and Ootsa Lake.
Remarks: This species is palatable to stock and sometimes sufficiently abundant locally to be an important forage grass, and is frequently cut for hay.



Beckmannia syzigachne. Plant, ×⅓; spikelet and floret, ×3.

13. *Bouteloua* Lag. Grama Grass

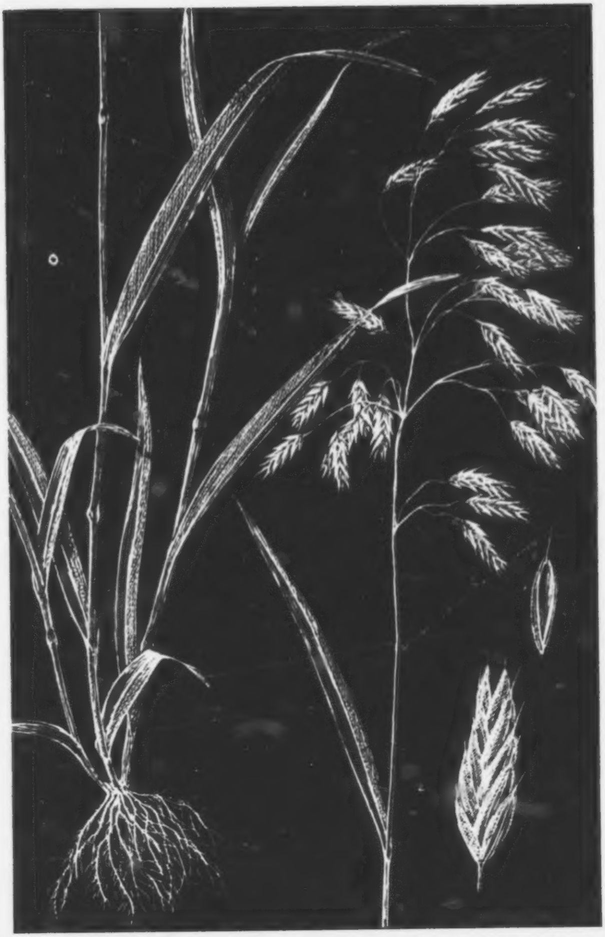
Annual or perennial, usually cæspitose grasses, the relatively short spikes solitary or 2 to many, racemose on a common axis. Spikelets with 1 perfect flower and 1 or more sterile rudiments, articulated above the glumes, inserted in 2 rows on one side of a narrow flat rachis. Glumes unequal, narrow, 1-nerved, acuminate to awn-pointed. Fertile lemma rounded on the back, 3-nerved, the lateral nerves marginal or submarginal, usually excurrent below the apex into short awns. Rudiment stipitate, reduced to an empty 3-awned lemma.

Bouteloua gracilis (H. B. K.) Lag. ex Steud. Blue Grama

Habit: Perennial, densely tufted.
Culms: Erect, 20 to 50 cm. tall, leafy at base.
Sheaths: Smooth or nearly so.
Blades: Flat or loosely involute, 1 to 2 mm. wide.
Inflorescence: Spikes, usually 2, sometimes 1 or 3, rarely more, 2.5 to 5 cm. long, falcate-spreading at maturity, the rachis not projecting beyond the spikelets.
Spikelets: Numerous, as many as 80, about 5 mm. long.
Glumes: Second glume 3.5 to 5 mm. long, scabrous and sparsely villous on the midnerve.
Lemmas: Fertile lemma pilose, the awn slender, the intermediate lobes acute; rudiment densely bearded at summit of rachilla, cleft to the base, the lobes rounded, the awn slender, about equalling the tip of fertile lemma; 1 or 2 additional rudiments, broad and awnless, sometimes developed.
Distribution: Plains, British Columbia to Wisconsin, south to Texas and California.
Distribution in British Columbia: Collected on only one site, Jaffray.

14. *Briza* L. Quaking Grass

Low annuals or perennials, with erect culms, flat blades, and usually open, showy panicles, the pedicels in our species capillary, allowing the spikelets to vibrate in the wind. Spikelets several-flowered, broad, often cordate, the florets crowded and spreading horizontally, the rachilla disarticulating above the glumes and between the florets; glumes about equal, broad, papery-chartaceous, with scarious spreading margins, cordate at base, several-nerved,



Bromus ciliatus. Plant, × ⅓; spikelet and floret, × 1.

the nerves often obscure, the apex in our species obtuse or acutish; palea much shorter than the lemma.

Briza media L. Quaking Grass

Habit: Perennial.
Culms: 15 to 60 cm. tall, erect.
Blades: Flat, 2 to 5 mm. wide.
Sheaths: Longer than the narrow blades.
Inflorescence: Panicle terminal, 5 to 10 cm. long, erect, the stiff capillary branches spreading, showy, naked below.
Spikelets: Nodding, 5- to 12-flowered, 5 to 6 mm. long, nearly as broad, brown and shining, the florets crowded and spreading horizontally.
Glumes: Subequal, firm-membranous, with broad scarious margins.
Lemmas: Boat-shaped, 5- to many-nerved (nerves often obscure), firm, sub-chartaceous with a scarious margin.
Distribution: Fields and waste places, Ontario to Michigan. Introduced from Europe.
Distribution in British Columbia: Only one specimen in the Provincial Museum, collected at Alberni, British Columbia.

15. *Bromus* L. Brome Grass

Annual or perennial, low or often rather tall grasses with closed sheaths, flat blades, and open or contracted exserted panicles. Spikelets rather large, mostly 15 mm. long or more, several flowered, strongly flattened or rounded, the articulation above the glumes and between the florets. Glumes unequal and shorter than the first florets. Lemmas convex on the back or sometimes keeled, 5- to 9-nerved, 2-toothed at the apex, and awnless or awned from between the teeth.

The most important species agronomically is smooth brome, *Bromus inermis*, a native of Eurasia, which is cultivated for hay and pasture.

KEY TO THE SPECIES OF BROMUS

1*a*. Spikelets strongly flattened, the lemmas compressed, keeled.
  Panicle branches elongate, slender, drooping sheath smooth .... 1. *B. sitchensis*
  Panicle branches not elongated.
    Panicle branches ascending, rather stiff, naked below bearing 1 or 2 large spikelets .... 2. *B. aleutensis*
    Panicle branches short and ascending or longer and drooping, with some short branches at the base.

Blades canescent, densely short-pilose, 2 to 5 mm. wide, often involute; panicle narrow .... 3. *B. breviaristatus*
Blades not canescent, glabrous to puberulent or sparsely pilose, mostly 5 to 12 mm. wide.
Sheath strongly to sparsely retrorsely pilose; blades 4 to 12 mm. wide; lemmas usually pubescent, the awns mostly less than 7 mm. long, plants perennial .... 4. *B. marginatus*
Sheaths scaberulous to pilose .... 5. *B. carinatus*

1*b*. Spikelets terete before anthesis or somewhat flattened, but the lemmas not compressed, keeled.

2*a*. Plants perennial.
Creeping rhizomes present.
Lemmas glabrous .... 6. *B. inermis*
Lemmas pubescent near margins .... 7. *B. pumpellianus*
Creeping rhizomes absent.
Panicle narrow the branches erect .... 8. *B. erectus*
Panicle open, the branches spreading and drooping.
Lemmas pubescent along the margin and on lower part of the back, the upper part glabrous.
Ligule prominent, lemmas narrow .... 9. *B. vulgaris*
Ligule inconspicuous, lemmas broad .... 10. *B. ciliatus*
Lemmas pubescent rather evenly over the back.
Panicle branches short, stiffly spreading; blades short, mostly on lower part of culm .... 11. *B. orcottianus*
Panicle branches lax, or drooping blades along the culm mostly elongate .... 12. *B. anomalus*

2*b*. Plants annual.
Lemmas broad, rounded above.
Panicle contracted, rather dense.
Lemmas glabrous .... 13. *B. racemosus*
Lemmas pubescent .... 14. *B. mollis*
Panicle open, the branches spreading.
Awn short or wanting; lemmas obtuse, inflated 15. *B. brizæformis*
Awn well developed.
Foliage glabrous .... 16. *B. secalinus*
Foliage pubescent.
Branches of the panicle rather stiffly spreading or drooping, awn straight .... 17. *B. commutatus*
Branches lax or flexuous, rather stout.
Spikelets inflated, 5 to 10 mm. wide, awns flattened, strongly divergent, about 1 cm. long .... 18. *B. squarrosus*
Spikelets not inflated, usually less than 5 mm. wide, if more the spikelet pubescent; straight awn not strongly flattened .... 19. *B. japonicus*

Lemmas narrow with a sharp callus.
  Panicle contracted, erect; awn 12 to 20 mm. long .... 20. *B. rubens*
  Panicle open, the branches spreading.
    Second glume usually less than 1 cm. long; pedicels capillary, flexuous .... 21. *B. tectorum*
    Second glume more than 1 cm. long, pedicels sometimes flexuous, not capillary.
      Awn about 2 cm. long, first glume 8 mm. long ..... 22. *B. sterilis*
      Awn about 3 to 5 cm. long, first glume about 15 mm. long .... 23. *B. rigidus*

1. *Bromus sitchensis* Trin.

Habit: Stout, smooth perennial.
Culms: 120 to 180 cm. tall.
Sheaths: Glabrous.
Blades: Elongate, 7 to 12 mm. wide, sparsely pilose on the upper surface.
Inflorescence: A large panicle, lax, drooping, 25 to 35 cm. long, the 2 to 4 lower branches as much as 20 cm. long, naked below for as much as 10 to 15 cm., few-flowered.
Spikelets: 2.5 to 3.5 cm. long, 6- to 12-flowered. The rachilla joints exposed at anthesis.
Lemmas: Scabrous, sometimes hirtellous toward base, awn 5 to 10 mm. long.
Distribution: Woods and banks along the coast from Alaska to Oregon.
Distribution in British Columbia: Near the coast, West Quesnel, and Victoria.

2. *Bromus aleutensis* Trin. ex Griseb.

Habit: Perennial.
Culms: Rather stout, erect from a usually decumbent base, 50 to 100 cm. tall.
Sheaths: Sparsely retrorse-pilose or glabrous.
Blades: Sparsely pilose, 5 to 10 mm. wide.
Inflorescence: An erect panicle, loose, 10 to 20 cm., the branches rather stiffly ascending, bearing 1 to 2 spikelets, the lower as much as 10 cm. long.
Spikelets: 2.5 to 3.5 cm. long, 3- to 6-flowered.
Glumes: Subequal, the first 3-nerved, the second 5- or indistinctly 7-nerved.
Lemmas: Broadly lanceolate, 7-nerved, scarious-margined, smooth to scabrous-pubescent, about 15 mm. long; awn mostly about 1 cm. long.
Distribution: Open ground, Aleutian Islands to the Olympic Mountains.
Distribution in British Columbia: Triangle Island.

3. *Bromus breviaristatus* Buckl.

Bromus subvelutinus Shear.
Habit: Erect tufted perennial.

Culms: 25 to 50 cm. tall.

Sheaths: Canescent to densely retrorse-pilose.

Blades: Narrow, becoming involute, canescent and also pilose with spreading hairs, mostly erect or ascending, often only 1 to 2 mm. wide.

Inflorescence: A narrow panicle, erect, 5 to 15 cm. long, the branches short, appressed, often bearing one spikelet.

Spikelets: 2 to 3 cm. long.

Glumes: Broad, acute, minutely scabrous, the first 3- to 5-nerved, the second 5- to 9-nerved.

Lemmas: Appressed pubescent; awn 3 to 10 mm. long.

Distribution: British Columbia to Wyoming, eastern Washington, Nevada, and California.

Distribution in British Columbia: Around Kelowna.

4. *Bromus marginatus* Nees

Habit: Perennial.

Culms: Rather stout, 6 to 12 dm. high.

Sheaths: Mostly conspicuously retrorsely pilose.

Blades: Commonly pubescent, 6 to 12 mm. wide.

Inflorescence: A panicle usually less open than in *Bromus carinatus*.

Spikelets: Mostly closely flowered.

Lemmas: Strongly pubescent, awns usually less than 7 mm. long.

Distribution: Open woods, meadows, and waste places, British Columbia to California, Alberta to South Dakota, and New Mexico.

Distribution in British Columbia: Vancouver Island to the Rockies, Comox, Malahat. Common in Kootenay.

Remarks: This species is very variable, intergrading with *Bromus carinatus* and scarcely distinct though extremes are very different in appearance.

5. *Bromus carinatus* Hook. and Arn. California Brome

Bromus hookerianus Thurb.

Habit: Erect annual or mostly biennial.

Culms: 50 to 100 cm. tall.

Sheaths: Scabrous to rather sparsely pilose.

Blades: Flat, mostly 20 to 30 cm. long, the lower ones shorter, scabrose or sparsely pilose, mostly 3 to 10 mm. wide.

Inflorescence: A panicle, mostly 15 to 30 cm. long, with drooping branches, in small plants much reduced.

Spikelets: 2 to 3 cm. long, mostly 6- to 10-flowered, the florets in anthesis not or scarcely overlapping, exposing the relatively long rachilla joints.

Glumes: Acuminate, the first 6 to 9 mm., the second 10 to 15 mm. long.

Palea: Acuminate, nearly as long as the lemma, the teeth short-awned.

Distribution: Open ground, woods, and waste places at low and middle altitudes; common on the Pacific coast, British Columbia to California, Idaho and New Mexico.

Distribution in British Columbia: Vancouver Island, Tetana Lake, and Nelson.

6. *Bromus inermis* Leyss. Smooth Brome

Habit: Perennial.
Culms: Erect, 50 to 100 cm. tall from creeping rhizomes.
Sheaths: Glabrous.
Blades: Smooth or nearly so, 5 to 10 mm. wide.
Inflorescence: A panicle, 10 to 20 cm. long, erect, the branches whorled, spreading in flower, contracted at maturity.
Spikelets: 2 to 2.5 cm. long, subterete before flowering.
Glumes: First glume 4 to 5 mm. long, second 6 to 8 mm. long.
Lemmas: 9 to 12 mm. long, glabrous or somewhat scabrous, rarely villous, obtuse, emarginate, mucronate, or with an awn 1 to 2 mm. long.
Ligule: 1.5 to 2 mm. long.
Distribution: Extremely wide distribution, cultivated for hay and pasture.
Distribution in British Columbia: Introduced Victoria, Okanagan, and Lasqueti Island.
Remarks: Used for reseeding western mountain ranges; introduced from Europe.

7. *Bromus pumpellianus* Scribn.

Habit: Perennial.
Culms: 50 to 120 cm. tall, from creeping rhizomes.
Sheaths: Glabrous or pubescent.
Blades: Rather short, mostly glabrous beneath, scabrous or somewhat pubescent on upper surface.
Inflorescence: A panicle 10 to 20 cm. long, rather narrow, erect, the branches short, erect, or ascending.
Spikelets: 7- to 11-flowered, 2 to 3 cm. long.
Glumes: First glume 1-nerved, the second 3-nerved.
Lemmas: 10 to 12 mm. long, 5- to 7-nerved, pubescent along the margin and across the back at base, slightly emarginate; awn mostly 2 to 3 mm. long.
Distribution: Native of the western States and British Columbia. Introduced in northern Michigan and eastern Ontario. Meadows and grassy slopes.
Distribution in British Columbia: Columbia Valley, Field, and Vanderhoof.

8. *Bromus erectus* Huds.

Bromus macounii Vasey.
Habit: Tufted perennial with rhizomes.
Culms: Erect, 60 to 90 cm. tall, slender.
Sheaths: Sparsely pilose or glabrous.
Blades: Narrow, sparsely pubescent.
Inflorescence: A panicle, 10 to 20 cm. long, narrow, erect, the branches ascending or erect.
Spikelets: 5- to 10-flowered.

Glumes: Acuminate, the first 6 to 8 mm., the second 8 to 10 mm. long.

Lemmas: 10 to 12 mm. long, glabrous or evenly scabrous-pubescent over the back; awn 5 to 6 mm. long.

Distribution: Established in a few localities from Maine to New York; also British Columbia to California and West Virginia.

Distribution in British Columbia: Vancouver Island.

Remarks: Introduced from Europe.

9. ***Bromus vulgaris*** **(Hook.) Shear.**

Habit: Perennial with creeping rhizomes.

Culms: Slender, 80 to 120 cm. tall, the nodes pubescent.

Sheaths: Pilose.

Blades: More or less pilose, to 12 mm. wide.

Inflorescence: A panicle, 10 to 15 cm. long, the branches slender, drooping.

Spikelets: Narrow, about 2.5 cm. long.

Glumes: Narrow, the first acute, 1-nerved, 5 to 8 mm. long, the second broader, longer, obtuse to acutish, 3-nerved.

Lemmas: 8 to 10 mm. long, sparsely pubescent over the back, more densely near the margins, or nearly glabrous; awn 6 to 8 mm. long.

Ligules: 3 to 5 mm. long.

Distribution: Rocky woods and shady ravines, western Montana and Wyoming to British Columbia and California.

Distribution in British Columbia: Vancouver Island, Okanagan, Loup Garou and Aleza Lakes.

10. ***Bromus ciliatus*** **L. Fringed Brome**

Habitat: Perennial, without creeping rhizomes.

Culms: Slender, 70 to 120 cm. tall, glabrous or pubescent at the nodes.

Sheaths: Glabrous or the lower short-pilose, mostly shorter than the internodes.

Blades: Rather lax, as much as 1 cm. wide, sparsely pilose to glabrous on both surfaces.

Inflorescence: A panicle, 15 to 25 cm. long, open, the branches slender, drooping, as much as 15 cm. long.

Spikelets: Drooping, 4- to 10-flowered, 1 to 2 cm. long.

Glumes: First glume 1-nerved, the second 3-nerved.

Lemmas: 10 to 12 mm. long, pubescent near the margin on the lower half to three-fourths, glabrous or nearly so on the back; awn 3 to 5 mm. long.

Distribution: Moist woods and thickets, Newfoundland to Washington, south to New Jersey, Iowa, west Texas, and southern California.

Distribution in British Columbia: Chilcotin and Cariboo Districts, Vancouver Island, and Columbia Valley.

11. *Bromus orcuttianus* Vasey

Habit: Tufted perennial.

Culms: 80 to 120 cm. tall, erect, leafy below, nearly naked above, pubescent at and below the nodes.

Sheaths: Pilose or more or less velvety or sometimes glabrous.

Blades: Rather short and erect.

Inflorescence: A panicle, 10 to 15 cm. long, narrow-pyramidal, the few rather rigid short branches finally divaricate.

Spikelets: About 2 cm. long, not much flattened, on short pedicels.

Glumes: Narrow, smooth, or scabrous, the first 6 to 8 mm. long, acute, 1-nerved, or sometimes with faint lateral nerves, the second 8 to 10 mm. long, broader, obtuse, 3-nerved.

Lemmas: 10 to 12 mm. long, narrow, inrolled at the margin, obscurely nerved, scabrous over the back; awn 5 to 7 mm. long.

Distribution: Open woods; British Columbia, Washington to California.

Distribution in British Columbia: Oak woods, Victoria.

12. *Bromus anomalus* Rupr. Nodding Brome

Bromus porteri Nash.

Habit: Perennial without creeping rootstock.

Culms: Slender, 30 to 60 cm. tall, nodes pubescent.

Sheaths: Sparsely pilose to glabrous.

Blades: Scabrous, mostly 2 to 4 mm. wide.

Inflorescence: A panicle, about 10 cm. long, often less, few-flowered, drooping.

Glumes: First glume 3-nerved, the second 5-nerved.

Lemmas: About 12 mm. long, evenly and densely pubescent over the back; awn 2 to 4 mm. long.

Ligules: About 1 mm. long.

Distribution: Open woods and fields, Saskatchewan and Idaho to Mexico.

Distribution in British Columbia: Between Clinton and Gang Ranch, Chilcotin, Cariboo.

13. *Bromus racemosus* L.

Habit: Annual.

Culms: 4 to 9 dm. tall, glabrous or nearly so.

Sheaths: Finely villous with retrorse hairs.

Blades: 3 to 6 mm. wide, pubescent on both sides.

Inflorescence: A panicle, normally 1 to 2 dm. long, at first erect, nodding at maturity, at least some of its branches elongate and exceeding the spikelets.

Spikelets: 5- to 10-flowered, glabrous or minutely scaberulous.

Glumes: First glume narrowly lanceolate, 3-nerved, 4.5 to 6.5 mm. long, second glume broader 5-nerved, 5.6 to 9 mm. long.

Lemmas: Elliptic or somewhat obovate, 6.5 to 10 mm. long, 7- to 9-nerved, the awns 3 to 10 mm. long, the upper often twice as long as the lower.

Distribution: Native of Europe; widely introduced in fields, roadsides, and waste ground, chiefly on the Pacific coast and east to Montana, Colorado, and Arizona. Also found in Illinois to Maine and North Carolina.

Distribution in British Columbia: Introduced, very common on Vancouver Island, eastward. Christina Lake.

14. *Bromus mollis* L. Soft Chess

Bromus hordaceus L.

Habit: Plants annual.

Culms: Erect, 20 to 80 cm. tall, glabrous or puberulent.

Sheaths: Pubescent.

Blades: Pubescent, 3 to 6 mm. wide.

Inflorescence: A panicle, rather dense, 5 to 10 cm. long, or in depauperate plants reduced to a few spikelets.

Spikelets: 6- to 9-flowered, usually softly pubescent, rarely glabrous.

Glumes: Broad, obtuse, coarsely pilose, the first 3- to 5-nerved, 4 to 6 mm. long, the second 5- to 7-nerved, 7 to 8 mm. long.

Lemmas: Broad, soft, obtuse, 7-nerved, coarsely pilose, rather deeply bidentate, 8 to 9 mm. long, the margin and apex hyaline; awn rather stout, 6 to 9 mm. long.

Palea: About three-fourths as long as lemma.

Distribution: Native of Europe; abundant on the Pacific coast from Alaska to California. Occasionally eastward to Nova Scotia and south to North Carolina.

Distribution in British Columbia: Lower Fraser Valley and Vancouver Island.

15. *Bromus brizæformis* Fisch. & Mey. Rattlesnake Chess

Habit: Annual.

Culms: 30 to 60 cm. tall.

Sheaths: Pilose-pubescent.

Blades: Pilose-pubescent.

Inflorescence: A panicle, 5 to 15 cm. long, lax, drooping.

Spikelets: Rather few, oblong-ovate, 1.5 to 2.5 cm. long, about 1 cm. wide.

Glumes: Broad, obtuse, the first 3- to 5-nerved, the second 5- to 9-nerved, about twice as long as the first.

Lemmas: 10 mm. long, very broad, inflated, obtuse, smooth, with a broad scarious margin, nearly or quite awnless.

Distribution: Sandy fields and waste ground; Alaska to Washington, Montana, and Wyoming. Introduced from Europe.

Distribution in British Columbia: Specimen in Dominion Range Experiment Station herbarium. Henry lists it as occurring at Lac du Bois.

Remarks: Sometimes cultivated for ornament.

16. *Bromus secalinus* L. Chess

Habit: Plants annual.

Culms: Erect, 30 to 60 cm. tall.

Sheaths: Middle and upper sheaths glabrous.

Blades: Glabrous or pubescent, 3 to 8 mm. wide.

Inflorescence: A pyramidal panicle, nodding, 7 to 12 cm. long, the lower branches 3 to 5 unequal, slightly drooping.

Spikelets: Ovoid-lanceolate, becoming somewhat turgid at maturity, 1 to 2 cm. long, 6 to 8 mm. wide.

Glumes: Obtuse, the first 3- to 5-nerved, 4 to 6 mm. long, the second 7-nerved, 6 to 7 mm. long.

Lemmas: 7-nerved, 6 to 8 mm. long, eliptic, obtuse, smooth or scaberulous, the margins strongly involute at maturity, shortly bidentate at apex, the undulate awns usually 3 to 5 mm. long, sometimes very short or obsolete.

Palea: About as long as lemma.

Distribution: Introduced from Europe, a weed in grain-fields and waste places, more or less throughout the United States; found sparingly in British Columbia.

Distribution in British Columbia: Lillooet and Vancouver Island.

17. *Bromus commutatus* Schrad. Hairy Chess

Habit: Annual.

Culms: 6 to 10 dm. high.

Sheaths: Pilose.

Blades: Pilose, 3 to 5 mm. wide.

Inflorescence: A rather narrow panicle.

Spikelets: Nodding, 12 to 20 mm. long.

Glumes: Slightly scabrous, obtuse, the first 3- to 5-nerved, the second 7- to 9-nerved.

Lemmas: Glabrous, the margins not inrolled above the middle at maturity; awns 7 to 10 mm. long.

Distribution: Fields and waste ground. Introduced from Europe, now found from British Columbia to California, Montana, and Wyoming, eastward through the northern States and thence less commonly southward.

Distribution in British Columbia: Vancouver Island and Sumas.

18. *Bromus squarrosus* L.

Habit: Annual.

Culms: Mostly 20 to 30 cm. tall, erect.

Sheaths: Softly and densely pubescent.

Blades: Softly and densely pubescent, blades 5 to 15 cm. long, 2 to 4 mm. wide, usually erect.

Inflorescence: A nodding panicle, the relatively coarse, short subverticillate, flexuous, bearing one or two large spikelets.

Spikelets: About 2 cm. long, 5 to 8 mm. wide, somewhat inflated; awns flat, spreading or recurved, about 1 cm. long.

Distribution: Introduced from Europe. Found in Michigan and North Dakota.

Distribution in British Columbia: Kamloops and Roosville.

19. *Bromus japonicus* Thumb. Japanese Chess

Bromus patulus M. & K.

Habit: Annual.

Culms: Slender, 4 to 7 dm. high.

Sheaths: Softly villous.

Blades: Softly villous, short, 2 to 4 mm. wide.

Inflorescence: A loose and open panicle, somewhat nodding, with very slender sinuous branches, the spikelets borne near the ends of the main branches.

Spikelets: 1 to 2.5 cm. long.

Glumes: Broad, acutish, the first 3 mm. long, the second 5 mm.

Lemmas: Broad, 2-toothed at apex, 7 to 9 mm. long, glabrous or finely scabrous, the spreading awns 8 to 12 mm. long.

Distribution: As a weed in waste places. British Columbia, Alberta, and from Vermont to Washington, south to North Carolina and California. Introduced from Asia.

Distribution in British Columbia: Kamloops and Kelowna.

20. *Bromus rubens* L. Foxtail Chess

Habit: Tufted annual.

Culms: 15 to 40 cm. tall, puberulent below the panicles.

Sheaths: Pilose.

Blades: Narrow, mostly pilose.

Inflorescence: An erect panicle, compact, ovoid, usually 4 to 8 cm. long, usually purplish.

Spikelets: 4- to 11-flowered, about 2.5 cm. long.

Glumes: First glume 7 to 9 mm. long, the second 7 to 12 mm. long.

Lemmas: Scabrous to coarsely pubescent, 12 to 16 mm. long, the teeth 4 to 5 mm. long; awn 18 to 22 mm. long, somewhat spreading at maturity.

Distribution: Dry hills and in waste places or in cultivated ground. British Columbia to southern California, and east to Idaho, Utah, Arizona, and Texas. Introduced from Europe.

Distribution in British Columbia: Henry lists it from Nanaimo.

21. *Bromus tectorum* L. Downy Chess

Habit: Annual.

Culms: Erect or spreading, slender, 30 to 60 cm. tall.

Sheaths: Pubescent.

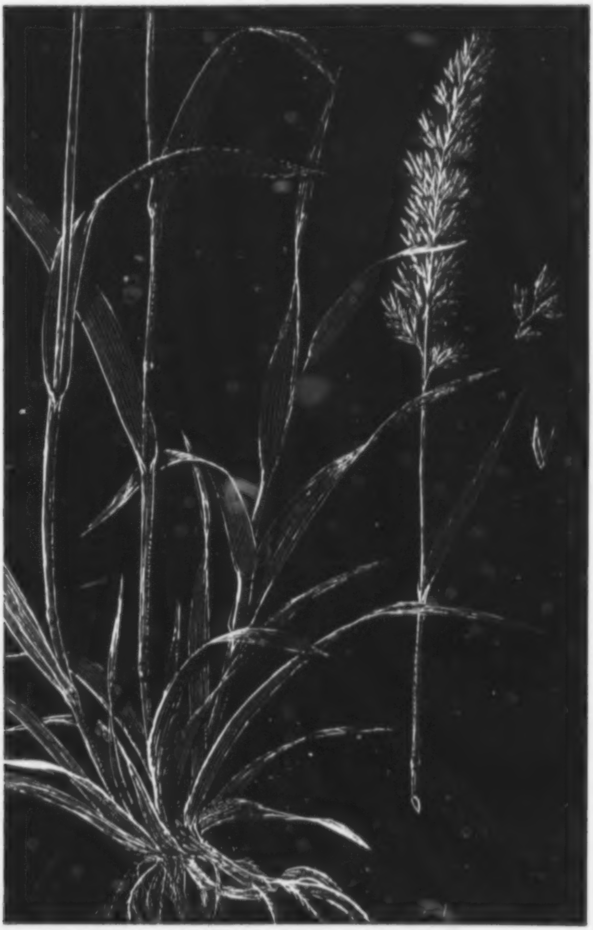
Blades: Softly pubescent, 2 to 4 mm. wide.
Inflorescence: A panicle, 1 to 2 dm. long, repeatedly branched, bearing rather crowded, drooping spikelets to 3 cm. long, on slender pedicels.
Spikelets: Nodding, 12 to 20 mm. long.
Glumes: Villous, the first 4 to 6 mm. long, the second 8 to 10 mm. long.
Lemmas: Lanceolate, villous or pilose, 10 to 12 mm. long, the teeth 2 to 3 mm. long; awn 12 to 14 mm. long.
Distribution: Along roadsides, banks, and waste places; common on the Pacific coast and in Alberta, and here and there throughout the United States.
Distribution in British Columbia: Very abundant in the dry region along the Fraser and the Thompson; Penticton and Saanichton.

22. *Bromus sterilis* L.

Habit: Tufted annual.
Culms: Slender, 5 to 10 dm. high.
Sheaths: Puberulent.
Blades: Soft, 2 to 4 mm. wide, short-pubescent on both faces.
Inflorescence: A panicle 10 to 20 cm. long, the branches drooping.
Spikelets: 2.5 to 3.5 cm. long, 6- to 10-flowered.
Glumes: Lanceolate-subulate, the first about 8 mm. long.
Lemmas: 17 to 20 mm. long, scabrous, the teeth 2 mm. long; awn 2 to 3 cm. long.
Distribution: Fields and waste places; introduced in a few localities from British Columbia to California and Colorado and New Mexico; in eastern States from New England and Illinois to Virginia. Introduced from Europe.
Distribution in British Columbia: Introduced, Vancouver Island and eastward; West Quesnel.

23. *Bromus rigidus* Roth. Ripgut

Bromus maximus Desf.
Habit: Annual.
Culms: Tufted, 4 to 12 dm. high.
Sheaths: Usually pilose.
Blades: Pilose, 4 to 12 mm. wide.
Inflorescence: An open panicle, nodding, rather few-flowered, 7 to 15 cm. long, the lower branches 1 to 2 cm. long.
Spikelets: Usually 5- to 7-flowered, 3 to 4 cm. long, excluding the awns.
Glumes: Smooth, the first 1.5 to 2 cm. long, the second 2.5 to 3 cm. long.
Lemmas: 2.5 to 3 cm. long, scabrous or puberulent, the teeth 3 to 4 mm. long; awns stout, 3.5 to 5 cm. long.
Distribution: A common weed in open ground and waste places; from British Columbia to California, east to Idaho and Arizona. Introduced from Mediterranean region.
Distribution in British Columbia: Vancouver Island.



Calamagrostis purpurascens. Plant, ×⅓; spikelet, ×1.

16. *Calamagrostis* Reedgrass

Perennial, usually moderately tall grasses, mostly with creeping rhizomes, with small spikelets in open or usually narrow, sometimes spike-like panicles. Spikelets 1-flowered, the rachilla disarticulating above the glumes, prolonged behind the palea as a short, commonly hairy bristle; glumes about equal, acute or acuminate; lemma shorter and usually more delicate than the glumes, usually 5-nerved, the midnerve exserted as an awn, the callus bearing a tuft of hairs, these often copious and as long as the lemma.

Several species are important native forage grasses. Pinegrass, *C. rubescens,* is a leading range grass in the mountains.

KEY TO THE SPECIES OF CALAMAGROSTIS

- Awn longer than glumes, geniculate .... 1. *C. purpurascens*
- Awn included or scarcely longer than glumes, straight or geniculate.
  - Awn geniculate, protruding sidewise from the glumes; callus hairs rather sparse, shorter than the lemma.
    - Plants tufted not rhizomatous .... 2. *C. montanesis*
    - Plants rhizomatous, more than 60 cm. tall.
      - Sheath pubescent on the collar .... 3. *C. rubescens*
      - Sheath glabrous on the collar .... 4. *C. nutkaensis*
  - Awn straight.
    - Sheath pubescent on the collar .... 5. *C. scribneri*
    - Sheath glabrous on the collar.
      - Panicle rather loose and open .... 6. *C. canadensis*
      - Panicle more or less contracted.
        - Blades broad and short, as much as 5 mm. wide, nearly smooth .... 7. *C. crassiglumis*
        - Blades elongate, smooth or scabrous.
          - Blades firm, scabrous, rather rigid ligule 4 to 6 mm. long .... 8. *C. inexpansa*
          - Blades relatively soft, smooth beneath ligule 1 to 3 mm. long .... 9. *C. neglecta*

1. *Calamagrostis purpurascens* R. Br. Purple Reedgrass

Calamagrostis vaseyi Beal.
Habit: Tufted perennial.
Culms: Erect, 40 to 60 cm. or even 100 cm. tall, sometimes with short rhizomes.
Sheaths: Usually scabrous, the old sheaths persistent and fibrous.
Blades: 2 to 4 mm. wide, flat or more or less involute, rather thick, scabrous.

Inflorescence: A dense panicle, usually pinkish or purplish, spike-like, 5 to 12 cm. long, rarely longer.

Glumes: 6 to 8 mm. long, scabrous.

Lemmas: Nearly as long as glume, the apex with 4 setaceous teeth, the awn from near the base, finely geniculate, exserted about 2 mm.; hairs of callus and rachilla about one-third as long as the lemma.

Distribution: Rocks and cliffs, British Columbia south to California and east to South Dakota.

Distribution in British Columbia: Frequent in the Cariboo and northward; not common, but widely distributed farther south.

2. *Calamagrostis montanensis* Scribn. Plains Reedgrass

Habit: Perennial.

Culms: Stiffly erect, scabrous below the panicle, usually 20 to 40 cm. tall, with slender creeping rhizomes.

Sheaths: Lower sheaths rather papery, smooth.

Blades: Erect, mostly less than 2 mm. wide, more or less involute, scabrous, sharp-pointed.

Inflorescence: A dense panicle, erect, more or less interrupted, usually pale, 5 to 10 cm. long.

Spikelets: 4 to 5 mm. long, the pedicles very scabrous.

Glumes: Acuminate, scabrous.

Lemmas: Nearly as long as the glumes, finely 4-toothed, the awn attached about 1 mm. above the base, about equalling the lemma, slightly geniculate and protruding from side of glumes; palea nearly as long as the lemma; hairs of callus and rachilla rather abundant, about half as long as the lemma.

Distribution: Plains and dry open ground, Manitoba to British Columbia, south to Minnesota and Idaho.

Distribution in British Columbia: Invermere, Columbia Valley, and Fairmont Hotsprings.

3. *Calamagrostis rubescens* Buckl. Pinegrass

Habit: Perennial.

Culms: Slender, tufted, 60 to 100 cm. tall, with creeping rhizomes.

Sheaths: Smooth, pubescent on the collar, sometimes obscurely so.

Blades: Erect, 2 to 4 mm. wide, flat or somewhat involute, scabrous.

Inflorescence: A narrow panicle, spike-like or somewhat loose or interrupted, pale or purple, 7 to 15 cm. long.

Glumes: 4 to 5 mm. long, narrow, acuminate.

Lemmas: Pale, thin, about as long as glumes, smooth, the nerves obscure, the awn from near the base, geniculate, exserted from the side of the glumes, 1 to 2 mm. long above the bend, the callus hairs scant, about one-third as long as the lemma; rachilla 1 mm. long, the sparse hairs extending to 2 mm.

Distribution: Open pine woods, prairies, and banks, British Columbia to California.

Distribution in British Columbia: Chilcotin, Ainsworth, Long Beach, and Kootenay Bay; abundant at Cranbrook and lower Columbia Valley.

Remarks: A valuable range grass.

4. *Calamagrostis nutkænsis* (Presl.) Steud. Pacific Reedgrass

Habit: Perennial.

Culms: Stout, 1 to 1.5 m. tall with short rhizomes.

Blades: Elongate, 6 to 12 mm. wide, flat, becoming involute, gradually narrowed into a long point, scabrous.

Inflorescence: Panicle, usually purplish, narrow, rather loose, 15 to 30 cm. long, the branches rather stiffly ascending.

Glumes: 5 to 7 mm. long, acuminate.

Lemmas: About 4 mm. long, indistinctly nerved, the awn rather stout, from near the base, slightly geniculate, about equalling the lemma or shorter; hairs of callus and rachilla scarcely long.

Ligule: 3 to 8 mm. long.

Distribution: Along the coast in moist soil or wet wooded hills, from Alaska to central California.

Distribution in British Columbia: Triangle Island and west coast of Vancouver Island.

5. *Calamagrostis scribneri* Beal. Scribner Reedgrass

Habit: Tufted perennial.

Culms: Slender, 60 to 100 cm. tall, with numerous creeping rhizomes.

Sheaths: Lower sheaths loose, thin, upper scabrous, retrorsely pubescent on the collar.

Blades: Thin, elongate, 4 to 7 mm. wide, scabrous.

Inflorescence: Panicle, pale or purplish, narrow but rather lax, 10 to 15 cm. long.

Glumes: About 4 mm. long, acuminate.

Lemmas: A little shorter than the glumes, sharply toothed, the awn about as long as the glumes or a little longer, feebly bent, the callus hairs about half as long as the lemma; rachilla minute, its hairs nearly as long as the lemma.

Ligule: About 5 mm. long.

Distribution: Moist meadows, British Columbia south to New Mexico and east to Montana.

Distribution in British Columbia: Kootenay National Park, not common.

6. *Calamagrostis canadensis* (Michx.) Beauv. Bluejoint

Habit: Perennial.

Culms: Suberect, tufted, 60 to 100 cm. tall, with numerous creeping rhizomes.

Sheaths: Glabrous or rarely obscurely pubescent.

Blades: Numerous, elongate, flat, rather lax, scabrous, 4 to 8 mm. wide.

Inflorescence: A nodding panicle, from narrow and rather dense to loose and relatively open, especially at base, 10 to 25 cm. long.

Glumes: Usually 3 to 4 mm. long, smooth or more commonly scabrous, acute to acuminate.

Lemmas: Nearly as long as the glumes, smooth, thin in texture, the awn delicate, straight, attached just below the middle and extending to or slightly beyond its tip, the callus hairs abundant, about as long as the lemma; rachilla delicate, sparsely long-pilose.

Distribution: Marshes, wet places, open woods and meadows, British Columbia south to California, and over most of the States east to the Atlantic coast.

Distribution in British Columbia: Kootenay Lake, Fort Fraser, Nelson, and the Forbidden Plateau.

7. *Calamagrostis crassiglumis* Thurb.

Habit: Perennial.

Culms: Rather rigid, 15 to 40 cm. tall, with short rhizomes.

Sheaths: Lower sheaths overlapping, somewhat papery.

Blades: Flat, or somewhat involute, smooth, firm, about 4 to 5 mm. wide.

Inflorescence: A narrow panicle, dense, spike-like, 2 to 5 cm. long, dull purple.

Glumes: 3 to 4 mm. long, ovate, rather abruptly acuminate, purple, scaberulous, firm or almost indurate.

Lemmas: About as long as the glumes, broad, obtuse or abruptly pointed, the awn attached about the middle, straight, about as long as the lemma, the callus hairs abundant, about 3 mm. long; rachilla 1 mm. long, the hairs reaching to the apex of the lemma.

Distribution: Swampy soil, Vancouver Island south to California.

Distribution in British Columbia: No specimens, but Hitchcock lists it as occurring on Vancouver Island.

8. *Calamagrostis inexpansa* A. Gray. Northern Reedgrass

Habit: Perennial.

Culms: Tufted, 40 to 120 cm. tall, with rather slender rhizomes, often scabrous below the panicle.

Sheaths: Smooth, or somewhat scabrous, the basal ones numerous, withering but persistent.

Blades: Firm, rather rigid, flat or loosely involute, very scabrous, 2 to 4 mm. wide.

Inflorescence: A narrow panicle, dense, the branches mostly erect and spikelet-bearing from the base; 5 to 15 cm. long.

Glumes: 3 to 4 mm. long, abruptly acuminate, scaberulous.

Lemmas: As long as the glumes, scabrous, the awn attached about the middle, straight or nearly so, about as long as the glumes, the callus hairs half to three-fourths as long; rachilla 0.5 mm. long, some of the hairs reaching to tip of lemma.

Distribution: Meadows, marshes, and wet places, Greenland to Alaska, British Columbia to Maine, and all over the northern States.

Distribution in British Columbia: Field, Cranbrook, Chilcotin, Canal Flats, and Goose Island.

9. *Calamagrostis neglecta* (Ehrh.) Gaertn. Mey. & Schreb.

Habit: Perennial.

Culms: Erect, solitary or few together, 40 to 70 cm. tall.

Sheaths: Glabrous.

Blades: Involute, rather soft, glabrous on both sides, 1 to 3 mm. wide when unrolled.

Inflorescence: A spike-like panicle, subcylindric, scarcely or not at all lobed, 4 to 10 cm. long.

Glumes: Scaberulous on the keel, glabrous or nearly so on the sides, acuminate, the first 2.5 to 3.5 mm. long, the second barely shorter.

Lemmas: Nearly glabrous, 2.5 to 3 mm. long; callus hairs about half as long; awn inserted near the middle slightly exceeding the lemma.

Distribution: Marshes, sandy shores, and wet places, British Columbia to Greenland, south to Maine, Colorado, and Oregon.

Distribution in British Columbia: Not common; Riske Creek, Chilcotin, Ootsa Lake, and Bella Coola.

17. *Calamovilfa* Hack.

Rigid, usually tall perennials, with narrow or open panicles, some species with creeping rhizomes. Spikelets 1-flowered, the rachilla disarticulating above the glumes, not prolonged behind the palea; glumes unequal, chartaceous, 1-nerved, awnless, glabrous or pubescent, the callus bearded; palea about as long as the lemma.

Calamovilfa longifolia (Hook.) Scribn.

Habit: Perennial, with stout scaly rhizomes.

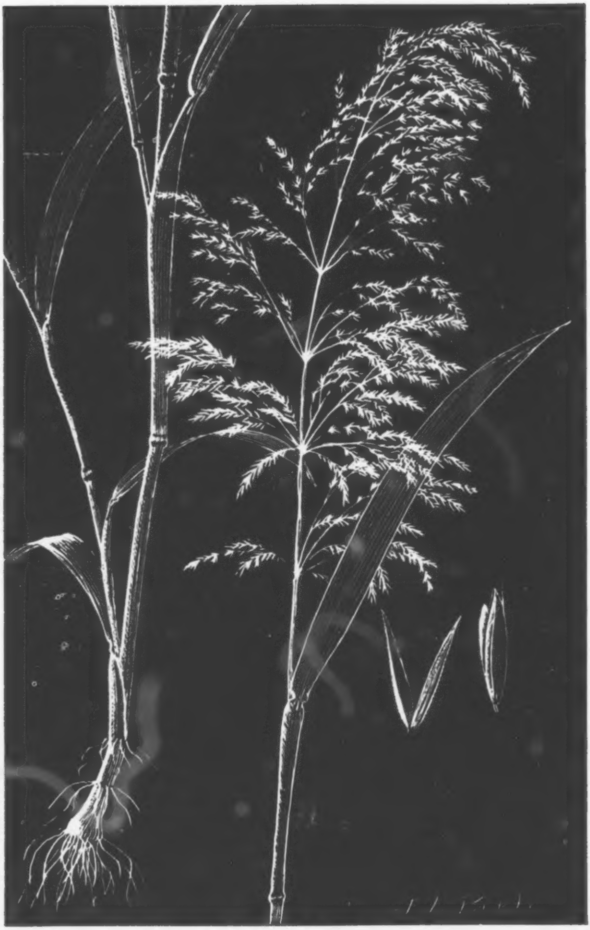
Culms: Mostly solitary, 50 to 180 cm. tall, with strong scaly creeping rhizomes.

Sheaths: Usually more or less appressed-villous, especially near the summit.

Blades: Firm, elongate, flat or soon involute, 4 to 8 mm. wide near base, tapering to a long fine point.

Inflorescence: A panicle, 15 to 35 cm. long, rather narrow to contracted, the branches ascending or appressed, sometimes slightly spreading.

Spikelets: Pale, 6 to 7 mm. long.



Cinna latifolia. Plant, ×¼; glumes and floret, ×5.

Glumes: Acuminate, the first about 2 mm. shorter than the second.

Lemmas: Somewhat shorter than the second glume, glabrous, the callus hairs copious, more than half as long as the lemma.

Distribution: Sand hills and sandy prairies or open woods, Michigan to British Columbia, south to Indiana, Colorado, and Idaho.

Distribution in British Columbia: Collected only from Tobacco Plains.

18. *Cinna* L. Woodreed

Tall perennials with flat blades and close or open panicles. Spikelets 1-flowered, disarticulating below the glumes, the rachilla forming a stipe below the floret and produced behind the palea as a minute bristle; glumes equal or subequal, 1- to 3-nerved; lemma similar to the glumes, nearly as long, 3-nerved, bearing a minute, short, straight awn just below the apex (rarely awnless); palea 1-keeled.

Cinna latifolia (Trev.) Griseb. Woodreed Grass

Agrostis latifolia Trevir.

Habit: Perennial.

Culms: Slender, 60 to 120 cm. high.

Blades: Thin and soft, deep green, scabrous, 5 to 12 mm. wide, narrow at the base.

Inflorescence: A panicle, 1.5 to 3 dm. long, very loose, the clusters of branches widely separated, lax and drooping.

Spikelets: 3 to 4 mm. long.

Glumes: Narrow, acuminate, the second a little longer than the first, scabrous or puberulent dorsally.

Lemma: The lemma equalling the shorter glume, with a minute apical awn.

Ligule: 5 to 10 mm. long.

Distribution: Moist woods, British Columbia to Newfoundland, south to North Carolina, Tennessee, and central California.

Distribution in British Columbia: Vancouver Island, Manning Park, Merritt, Wells Gray Park, and Langara Island.

19. *Corynephorus* Beauv.

Slender annuals with subfiliform blades and narrow panicles. Spikelets 2-flowered, disarticulating above the glumes; glumes nearly equal, 1-nerved, acute, membranaceous; lemmas thin, acute, awned from near the base, the awn jointed about the middle, the joint with a minute ring of hairs, the lower part straight, brown, the upper slender, club-shaped.

Corynephorus canescens **(L.) Beauv.**

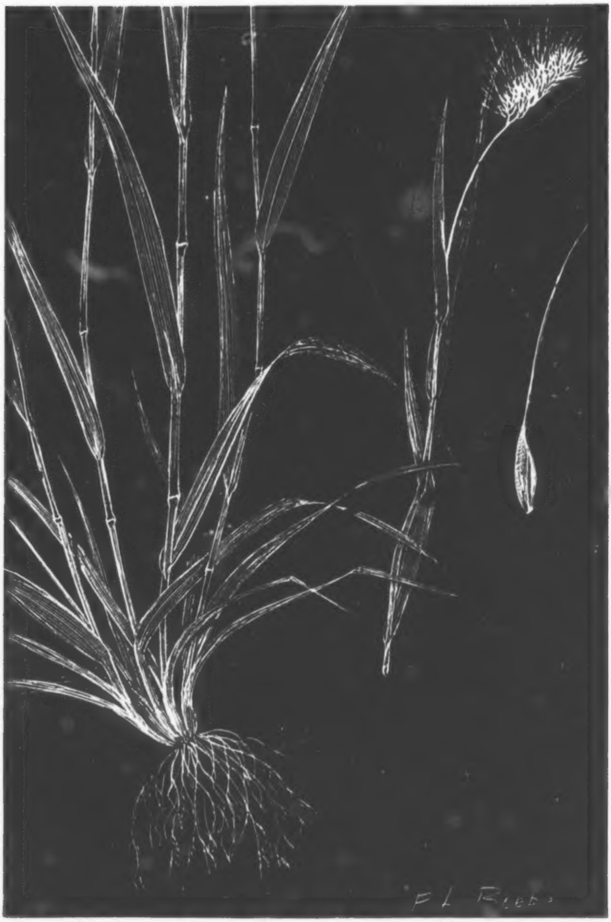
Aira canescens L.
Habit: Perennial.
Culms: Tufted, 20 to 35 cm. tall, branching and leafy at base.
Sheaths: Often purplish.
Blades: Rough, erect, mostly crowded near the base.
Inflorescence: A panicle, 5 to 10 cm. long, pale or purplish.
Spikelets: About 3.5 mm. long; florets about 1.7 mm. long, faintly nerved, the callus and rachilla softly pilose, the awns equalling or slightly exceeding the glumes.
Glumes: 2.8 to 3.6 mm. long.
Distribution: Waste ground and ballast, Long Island, New York, New Jersey, Pennsylvania, and British Columbia.
Distribution in British Columbia: Vancouver.
Remarks: Adventive from Europe.

20. *Cynodon* Rich.

Small perennials with elongated rootstocks or stolons; spikelets small, 1-flowered in several digitate spikes and arranged in two rows on one side of the rachis; rachilla prolonged beyond the flower, sometimes with a minute bract; glumes about equal, 1-nerved, longer than the lemma; lemmas firm, strongly compressed and keeled, without awn.

Cynodon dactylon **(L.) Pers. Bermuda Grass**

Capriola dactylon Kuntze.
Habit: Perennial.
Culms: Erect, from creeping and branching stolons with numerous sterile shoots, 1 to 3 dm. tall.
Sheaths: Loose, pilose at the throat.
Blades: Short, stiffish, flat or involute, 1 to 3 mm. wide, scabrous, sometimes slightly pilose.
Inflorescence: Spikes 4 to 5, 3 to 5 cm. long.
Spikelets: 2 to 2.5 mm. long, purplish.
Glumes: Strongly keeled, the second longer.
Lemmas: Rigid, shining, strongly compressed, surpassing the glumes.
Distribution: Open ground, grassland, fields, and waste places, British Columbia south to California, Florida, and Texas.
Distribution in British Columbia: Extremely rare, collected only from the Outer Wharf, Victoria.



Cynosurus echinatus. Plant, ×½; fertile floret, ×2½.

21. *Cynosurus* L. Dogtail

Annuals or perennials with narrow flat blades and dense spike-like or subcapitate panicles. Spikelets of two kinds, sterile and fertile together, the fertile sessile, nearly covered by the short-pediceled sterile one, these pairs imbricate in a dense 1-sided spike-like panicle; sterile spikelets consisting of 2 glumes and several narrow, acuminate 1-nerved lemmas on a continuous rachilla; fertile spikelets 2- or 3-flowered, the glumes narrow, the lemmas broader, rounded on the back, awn-tipped, the rachilla disarticulating above the glumes.

KEY TO THE SPECIES OF CYNOSURUS

Plants perennial; panicles narrow, spike-like; awns inconspicuous .... 1. *C. cristatus*

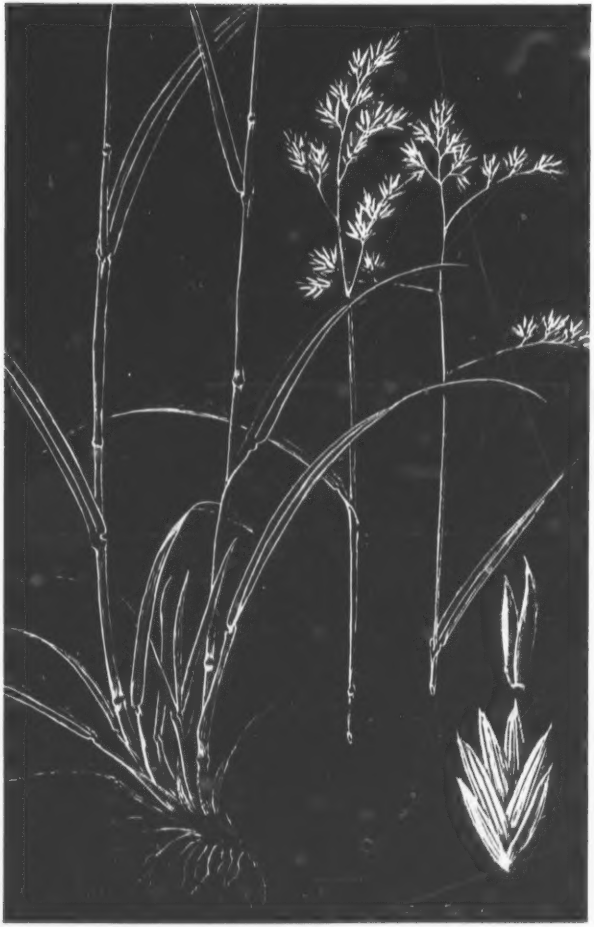
Plants annual; panicles subcapitate; awns conspicuous .... 2. *C. echinatus*

1. *Cynosurus cristatus* L. Crested Dogtail

Habit: Perennial.
Culms: Tufted or geniculate at base, erect, 30 to 60 cm. tall.
Sheaths: Glabrous.
Blades: Glabrous, 2 to 4 mm. wide.
Inflorescence: A spike-like panicle, linear, more or less curved, 3 to 8 cm. long.
Spikelets: Pairs of spikelets about 5 mm. long.
Lemmas: With awns mostly not more than 1 mm. long.
Distribution: Fields and waste places, Newfoundland to Michigan and North Carolina; British Columbia to California.
Distribution in British Columbia: Alberni and Victoria.
Remarks: Introduced from Europe. Occasionally cultivated in mixtures for meadows but of little value.

2. *Cynosurus echinatus* L. Bristly Dogtail Grass

Habit: Annual.
Culms: 20 to 40 cm. tall.
Sheaths: Loose.
Blades: Short, scabrous.
Inflorescence: A dense panicle, narrowly ovate, 1 to 4 cm. long, bristly.
Spikelets: Pairs of spikelets 7 to 10 mm. long.
Lemmas: With awns 5 to 10 mm. long.
Distribution: Open ground, British Columbia; Oregon to central California; North Carolina and Oklahoma.



Dactylis glomerata. Plant, ×⅓; spikelet and floret, ×3.

Distribution in British Columbia: Victoria, Telegraph Bay, and Discovery Island.
Remarks: Introduced from Europe.

22. *Dactylis* L. Orchardgrass

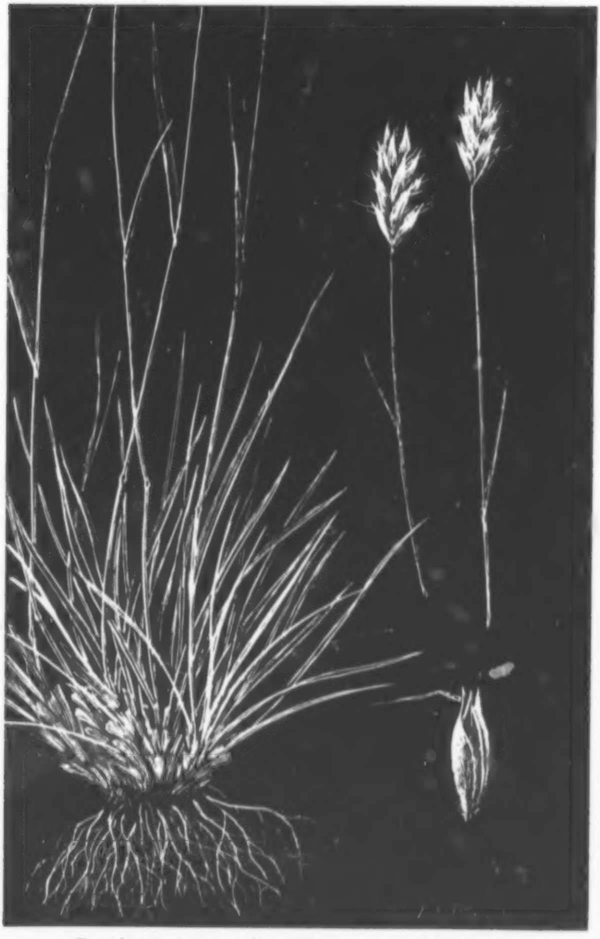
Perennial grasses with flat leaves; inflorescence a densely clustered or interrupted panicle; spikelets 2- to 5-flowered, short pediceled, in small one-sided fascicles, the flowers all perfect or the upper staminate; glumes thin, membranous, keeled, unequal, mucronate; lemmas larger than the glumes, rigid, 5-nerved, keeled, the midnerve extending into a point or short awn; palea shorter than the lemma; grain free, enclosed in the lemma and palea.

Dactylis glomerata L. Orchardgrass

Habit: Tufted perennial.
Culms: In large tussocks, 60 to 120 cm. tall.
Sheaths: More or less scabrous.
Blades: Elongate, 2 to 8 mm. wide.
Inflorescence: A panicle 5 to 20 cm. long, the few distant stiff solitary branches ascending, or spreading at anthesis, appressed at maturity, the lowermost sometimes as much as 10 cm. long.
Spikelets: Crowded in one-sided clusters.
Glumes: Lower glume nearly glabrous, the upper scabrous, awn-tipped, bristly-ciliate on the keel.
Lemmas: About 8 mm. long, mucronate or short-awned.
Distribution: Fields, meadows, and waste places, Newfoundland to southeastern Alaska; south through British Columbia to central California.
Distribution in British Columbia: Alberni, Victoria, Ootsa Lake, Snake Island, and Gordon River.
Remarks: Introduced from Eurasia and now commonly cultivated as a meadow and pasture grass. In England called cocksfoot. A variegated form is occasionally cultivated for borders.

23. *Danthonia* Lam. and DC. Oatgrass

Tufted low or moderately tall perennials, with few-flowered open or spike-like panicles or rather large spikelets. Spikelets several-flowered, the rachilla readily disarticulating above the glumes and between the florets; glumes about equal, broad, papery, acute, mostly exceeding the uppermost floret; lemmas rounded on the back, obscurely several-nerved, the apex bifid, the lobes acute,



Danthonia intermedia. Plant, × ½; floret, × 2.

usually extending into slender awns, a stout flat, twisted, geniculate awn arising from between the lobes. All our species produce cleistogenes (enlarged fertile, 1- or 2-flowered, cleistogamous spikelets) in the lower sheaths, the culms finally disarticulating at the lower nodes.

Key to the Species of Danthonia

Lemmas glabrous on the back, pilose on the margin only.
Panicle narrow, the pedicle appressed .... 1. *D. intermedia*
Panicle open, the slender pedicle spreading or reflexed.
Panicle usually a single spikelet .... 2. *D. unispicata*
Panicle of a few to several spikelets .... 3. *D. californica*
Lemmas pilose on the back, sometimes sparsely so .... 4. *D. spicata*

1. *Danthonia intermedia* Vasey. Timber Oatgrass

Habit: Densely tufted perennial.
Culms: 10 to 50 cm. tall.
Sheaths: Glabrous with long hairs in the throat.
Blades: Sub-involute, or those of the culm flat, glabrous or sparsely pilose.
Inflorescence: Purplish panicle, narrow, few-flowered, 2 to 5 cm. long, the branches appressed, bearing a single spikelet.
Glumes: About 15 mm. long.
Lemmas: 7 to 8 mm. long, appressed-pilose along the margin below and on the callus, the summit scaberulous, the teeth acuminate, aristate tipped; Terminal segment of awn 5 to 8 mm. long; palea narrowed above, notched at apex.
Distribution: Meadows and bogs, northern and alpine regions. Newfoundland to British Columbia and south to California.
Distribution in British Columbia: Widely distributed in the Province at medium altitudes on Garibaldi at 5,000 feet, descending to cultivated levels at Vanderhoof and Ootsa Lake.

2. *Danthonia unispicata* (Thurb.) Munro ex Macoun.
One-spike Oatgrass

Habit: Densely tufted perennial.
Culms: 15 to 25 cm. tall.
Sheaths: Pilose, the hairs spreading or reflexed.
Blades: Short, flat, or involute toward the tip, pilose above.
Inflorescence: A panicle reduced to a single spikelet or sometimes 2, rarely 3.
Spikelets: The lower usually reduced, their pedicles appressed or ascending, the long pedicle of the terminal spikelet jointed with the culm; spikelets on the average smaller than in the *D. californicus;* lemmas usually glabrous, the callus hairy.

Distribution: Open or rocky ground, Montana to British Columbia, south to California.

Distribution in British Columbia: Tranquille and Francois Lake.

3. *Danthonia californica* Boland. California Oatgrass

Habit: Tufted perennial.

Culms: 30 to 100 cm. tall, glabrous, tending to disarticulate at the nodes.

Sheaths: Glabrous, pilose at the throat.

Blades: Mostly 10 to 20 cm. long, flat or, especially those of the innovations, involute, glabrous.

Inflorescence: A panicle, bearing mostly 2 to 5 spikelets, the pedicles slender, spreading or somewhat reflexed, more or less flexuous, 1 to 2 cm. long, a rather prominent swelling at the base of each.

Glumes: 15 to 20 mm. long.

Lemmas: Excluding awns 8 to 10 mm. long, pilose on the lower part of the margins and on the callus, otherwise glabrous, the teeth long-aristate; terminal segment of awn 5 to 10 mm. long; palea subacute, usually extending beyond base of awn.

Distribution: Meadow and open woods, Montana to British Columbia and south to California.

Distribution in British Columbia: Vancouver Island.

Remarks: *D. californica* var. *americana* (Scribn.) Hitchc., culms on the average smaller, but large plants with large spikelets occur, with conspicuously pilose foliage. *D. macounii* Hitchc, appears to belong here, differing in having lemmas sparsely pilose on the back. Known only from Nanaimo and Vancouver Island. Collected by Macoun.

4. *Danthonia spicata* (L.) Beauv. ex Roem. and Schult.
Poverty Oatgrass

Habit: Perennial.

Culms: 20 to 70 cm. tall, mostly more than 50 cm., slender, terete; leaves numerous in a basal cluster.

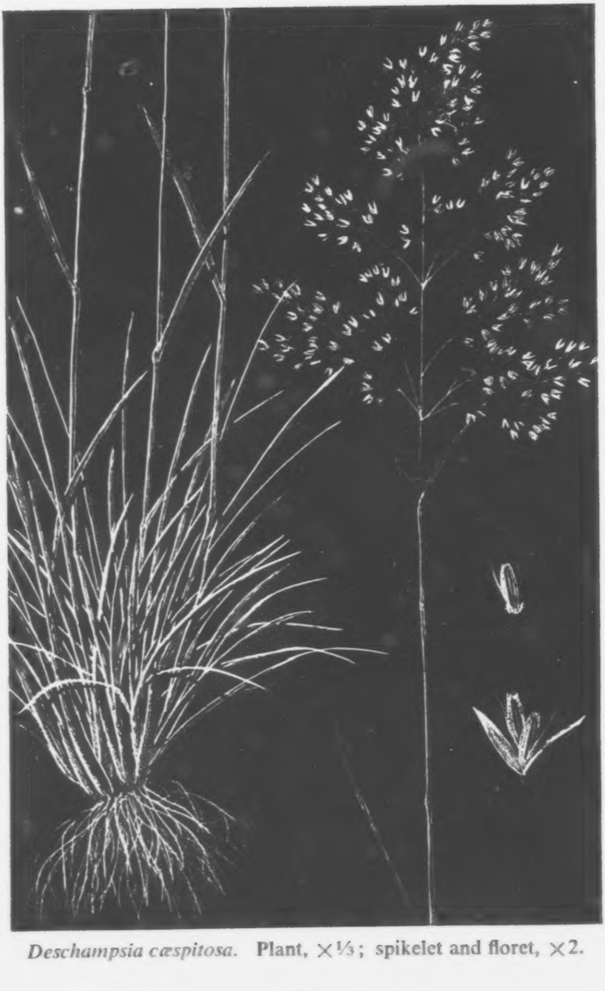
Sheaths: Glabrous or pilose above the nodes, with a tuft of long hairs in the throat.

Blades: Usually not more than 12 cm. long, filiform, to 2 mm. wide, occasionally a few blades 15 to 20 cm. long, sub-involute or in damp weather flat, glabrous or sparsely pilose.

Inflorescence: A panicle, 2 to 5 cm. long, rarely longer, the stiff short branches bearing a single spikelet, or the lower longer with 2, usually erect after anthesis.

Glumes: 10 to 12 mm. long.

Lemmas: 3.5 to 5 mm. long, sparsely villose except the 2-toothed summit, the teeth acuminate to subsetaceous; terminal segment of awn about 5 mm. long; palea broad, flat, obtuse, reaching to the base of the awn.



Deschampsia cæspitosa. Plant, × ⅓; spikelet and floret, × 2.

Distribution: Dry and sterile and rocky soil. Newfoundland to British Columbia, south to Florida, and eastern Kansas.

Distribution in British Columbia: Arrow Lakes, Yale, and Kootenay Lake.

24. *Deschampsia* Beauv. Hairgrass

Low or moderately tall annuals or usually perennials, with shining pale or purplish spikelets in narrow or open panicles. Spikelets 2-flowered, disarticulating above the glumes and between the florets, the hairy rachilla prolonged beyond the upper floret and sometimes bearing a reduced floret; glumes about equal, acute or acutish, membranaceous; lemmas thin, truncate and 2- to 4-toothed at summit, bearded at base, bearing a slender awn from or below the middle, the awn straight, bent or twisted.

Deschampsia cæspitosa is often the dominant grass in mountain meadows, where it furnishes excellent forage.

KEY TO THE SPECIES OF DESCHAMPSIA

Plants annual .... 1. *D. danthonioides*
Plants perennial.
  Panicle narrow, the distant branches appressed .... 2. *D. elongata*
  Panicle open or contracted, if narrow, not more than one-fourth the length of the culm.
    Blades thin, flat; glumes exceeding the florets .... 3. *D. atropurpurea*
    Blades firm or filiform; glumes not exceeding the upper floret.
      Blades filiform, flexuous; awn exserted, geniculate, twisted .... 4. *D. flexuosa*
      Blades flat or folded, stiff; awn included or slightly exserted, straight.
        Panicle open, usually nodding or drooping .... 5. *D. cæspitosa*
        Panicle narrow, condensed, erect .... 6. *D. holciformis*

1. *Deschampsia danthonioides* (Trin.) Munro ex Benth. Annual Hairgrass

Deschampsia calycina Presl.

Habit: Annual.

Culms: 15 to 60 cm. tall, slender, erect.

Blades: Few, short, narrow.

Inflorescence: An open panicle, 7 to 25 cm. long, the capillary branches commonly in twos, stiffly ascending, naked below, bearing a few short-pediceled spikelets toward the ends.

Spikelets: Narrow, 5 to 7 mm. long.

Glumes: 4 to 8 mm. long, 3-nerved, acuminate, smooth except the keel, exceeding the florets.

Lemmas: Smooth and shining, somewhat indurate, 2 to 3 mm. long, the base of the florets and the rachilla pilose, the awns geniculate, 4 to 6 mm. long.

Distribution: Open ground, Alaska, British Columbia, south to Montana and California.

Distribution in British Columbia: Widely distributed.

2. *Deschampsia elongata* (Hook.) Munro ex Benth.
Slender Hairgrass

Habit: Perennial.

Culms: Densely tufted, slender, erect, 30 to 120 cm. tall.

Sheaths: Smooth.

Blades: Soft, 1 to 1.5 mm. long, flat or folded, those of the basal tuft filiform.

Inflorescence: A narrow panicle, as much as 30 cm. long, the capillary branches appressed.

Spikelets: On short appressed pedicels.

Glumes: 4 to 6 mm. long, 3-nerved, equalling or slightly exceeding the florets.

Lemmas: 2 to 3 mm. long, smooth and shining, somewhat indurate, the base of the florets and rachilla pilose, the awn straight, 3 to 5 mm. long.

Distribution: Open ground, British Columbia to Wyoming, south to Arizona and California.

Distribution in British Columbia: Widely distributed, Vancouver Island, Nelson, Manning Park, and common along the coast.

3. *Deschampsia atropurpurea* (Wahl.) Scheele.
Mountain Hairgrass

Habit: Perennial.

Culms: Loosely tufted, erect, purplish at base, 40 to 80 cm. tall.

Sheaths: Glabrous, slightly glaucous.

Blades: Flat, rather soft, ascending or appressed, 5 to 10 cm. long, 4 to 6 mm. wide, acute or abruptly acuminate.

Inflorescence: Loose open panicle, 5 to 10 cm. long, the few capillary drooping branches naked below.

Spikelets: Mostly purplish to almost black, broad.

Glumes: About 5 mm. long, broad, the second 3-nerved, exceeding the florets.

Lemmas: Scabrous, about 2.5 mm. long, the callus hairs one-third to half as long, the awn of the first, straight, included, of the second geniculate, exserted.

Distribution: Woods and wet meadows, British Columbia to Newfoundland, south to Colorado and California.

Distribution in British Columbia: Vancouver Island, Kamloops, Mount Revelstoke, Nelson, and McBride

4. ***Deschampsia flexuosa*** **(L.) Trin. Crinkled Hairgrass**

Habit: Perennial.

Culms: Densely tufted, erect, slender, 30 to 80 cm. tall.

Sheaths: Scabrous.

Blades: Leaves mostly in a basal tuft, numerous, involute, slender or setaceous, flexuous.

Inflorescence: A loose open panicle, nodding, 5 to 12 cm. long, the capillary branches below, the branchlets spikelet-bearing toward the ends.

Spikelets: 4 to 5 mm. long, purplish or bronze, the florets approximate.

Glumes: 1-nerved, acute, shorter than the florets.

Lemmas: Scabrous, the callus hairs about 1 mm. long, the awn attached near the base, geniculate, twisted, 5 to 7 mm. long.

Distribution: Dry or rocky woods, slopes, and open ground, Alaska, British Columbia, south to Arkansas.

Distribution in British Columbia: West Point Grey, Vancouver.

5. ***Deschampsia cæspitosa*** **(L.) Beauv. Tufted Hairgrass**

Aira cæspitosa L.

Habit: Tufted perennial.

Culms: Leafy at base, erect, 60 to 120 cm. tall.

Sheaths: Smooth.

Blades: 1.5 to 4 mm. wide, often elongate, rather firm, flat or folded, scabrous above.

Inflorescence: An open loose panicle, nodding, 10 to 25 cm. long, the capillary scabrous branches and branchlets spikelet-bearing toward the ends.

Spikelets: 4 to 5 mm. long, pale or purple-tinged, the florets distant, the rachilla internode half the length of the lower floret.

Glumes: 1-nerved or the second obscurely 3-nerved, acute, about as long as the florets.

Lemmas: Smooth, the callus hairs short; awn from near the base, from straight and included in the glumes to weakly geniculate and twice as long as the spikelet.

Distribution: Wet places, Alaska, British Columbia, to California; east to Virginia.

Distribution in British Columbia: Vancouver Island, Mirror Lake, Prince George, Chilcotin, and Yoho.

6. ***Deschampsia holciformis*** **Presl.**

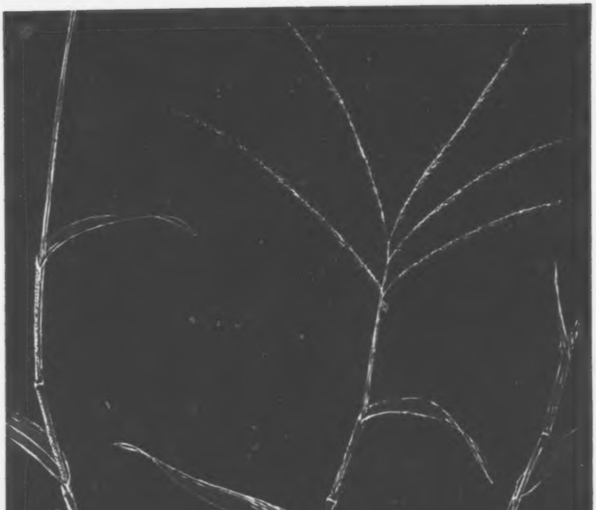
Habit: Tufted perennial.

Culms: Numerous basal leaves, erect, relatively robust, 50 to 125 cm. tall.

Sheaths: Loose, glabrous.

Blades: Mostly folded, 20 to 50 cm. long, 2 to 4 mm. wide, rather firm.

Inflorescence: A panicle, 10 to 25 cm. long, condensed, many-flowered, the branches appressed to ascending, purplish to brownish.



Digitaria sanguinalis. Plant, × ⅓; two views of spikelet, and floret, × 6.

Spikelets: 6 to 8 mm. long.
Glumes: Scaberulous, the glumes about equalling the spikelets or shorter, 3-nerved, the lateral nerves of the first often obscure.
Lemmas: Awned from below the middle, the awns erect, exceeding the spikelet, the callus hairs short.
Distribution: Marshes and sandy soil near the coast, Vancouver Island to central California.
Distribution in British Columbia: Listed as occurring on Vancouver Island by Hitchcock and from Alaska to California by Anderson.

25. *Digitaria* Heist.

Annual or perennial, often weedy grasses; inflorescence of two to several spike-like racemes from the summit of the culm; spikelets small, borne singly or 2 to 3 together in 2 rows on one side of a 3-angled rachis, plano-convex, lanceolate or elliptic; first glume very small or undeveloped, second sometimes as long as the sterile lemma; fertile lemma thick and rigid, shining.

Key to the Species of Digitaria

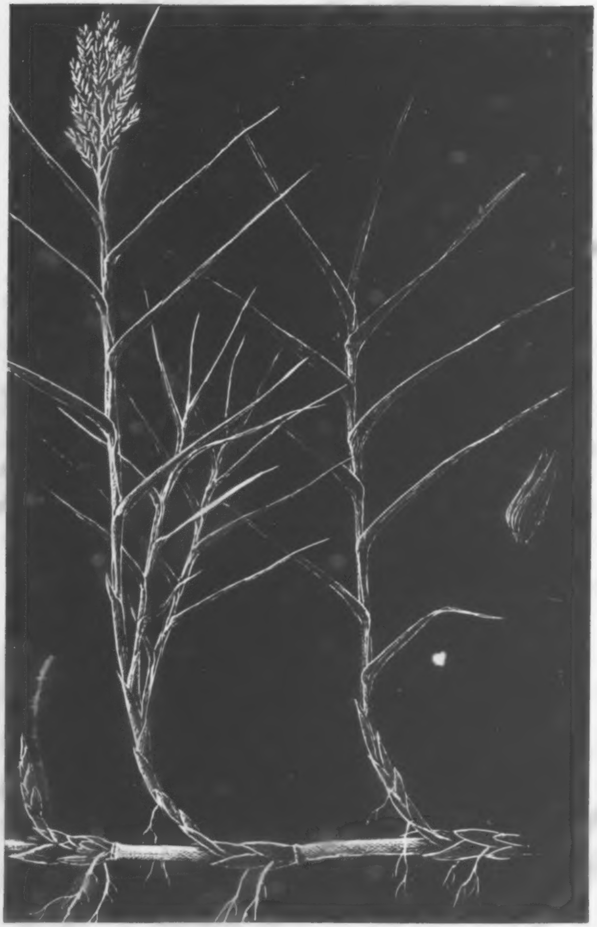
Blades and sheaths usually papillose-hirsute; racemes 3 to 12 .... 1. *D. sanguinalis*
Blades and sheaths glabrous or nearly so; racemes 1 to 5 ... 2. *D. ischaemum*

1. *Digitaria sanguinalis* (L.) Scop. Crab-grass

Syntherisma sanguinalis (L.) Dulac.
Habit: Tufted annual.
Culms: Often decumbent or creeping, 30 to 120 cm. long.
Sheaths: Loose, at least the lower, papillose-hirsute.
Blades: Flat, 5 to 12 cm. long, 4 to 10 mm. wide, often pubescent.
Inflorescence: Racemes 3 to 12, slender, 5 to 12 cm. long.
Spikelets: In twos, 1 subsessile, the other pedicelled, about 3 mm. long.
Glumes: First glume minute but evident, second about half as long as the spikelet.
Lemmas: Sterile lemma strongly nerved, the nerves scabrous.
Distribution: Fields, gardens, and waste places, a troublesome weed in lawns and cultivated ground throughout the United States and Canada.
Distribution in British Columbia: Occasionally in cultivated land but nowhere abundant. Kamloops, Lillooet, Chemainus, and Creston Flats.
Remarks: Introduced from Europe.

2. *Digitaria ischæmum* (Schreb.) Muhl. Smooth Crab-grass

Syntherisma humifusum Rydb.
Habit: Tufted annual.



Distichlis spicata. Plant, × 1; floret, × 3.

Culms: Very slender.

Sheaths: Glabrous or only slightly pubescent.

Blades: Glabrous, bluish or purplish.

Inflorescence: Racemes 1 to 5, dark purplish, very slender, 3 to 6 cm. long.

Glumes: First glume hyaline, obscure; second glumes and sterile lemma as long as the dark fertile lemma, pubescent with capitellate hairs.

Distribution: Waste places, often a troublesome weed in lawns. British Columbia to Quebec, south to Georgia, Washington, and California.

Distribution in British Columbia: Less common in British Columbia than *D. sanguinalis.*

Remarks: Introduced from Eurasia.

26. *Distichlis* Raf. Saltgrass

Low perennials, with extensively creeping scaly rhizomes, sometimes stolons, erect, rather rigid culms, and dense, rather few-flowered panicles. Plants diœcious; spikelets several to many-flowered, the rachilla of the pistillate spikelets disarticulating above the glumes and between the florets; glumes unequal, broad, acute, keeled, 3- to 7-nerved, the lateral nerves sometimes faint; lemmas closely imbricate, firm, the pistillate coriaceous, acute or subacute, with 9 to 11 mostly faint nerves; palea as long as the lemma or shorter, the margins bowed out near the base, the pistillate coriaceous, enclosing grain. Grasses of this genus in general have little value for forage.

KEY TO THE SPECIES OF DISTICHLIS

Panicles condensed, the spikelets imbricate .... 1. *D. spicata*

Panicles looser, the spikelets less imbricate, the individual spikelets plainly visible .... 2. *D. stricta*

1. *Distichlis spicata* (L.) Greene. Seashore Saltgrass

Habit: Perennial with long tough rootstocks.

Culms: 10 to 40 cm. tall, sometimes taller; leaves numerous.

Sheaths: Closely overlapping.

Blades: Spreading and conspicuously two-ranked, flat to involute, sharp-pointed, mostly less than 10 cm. long.

Inflorescence: A panicle usually pale or greenish, 1 to 6 cm. long, rarely longer.

Spikelets: Mostly 5- to 9-flowered, mostly 6 to 10 mm. long, compressed.

Glumes: Subequal.

Lemmas: 3 to 6 mm. long, the pistillate more coriaceous and more closely imbricate than the staminate.

Palea: Rather soft, narrow, the keels narrowly winged, entire; anthers about 2 mm. long.

Distribution: Seashores, forming dense colonies, Nova Scotia to Florida and Texas, British Columbia to California.

Distribution in British Columbia: Vancouver Island and the coast.

Remarks: Occasionally plants produce runners above ground as well as below.

2. *Distichlis stricta* (Torr.) Rydb. Desert Saltgrass

Distichlis spicata var. *stricta* (Gray) Beetle.

Habit: Perennial with long creeping stems and rootstocks.

Culms: 10 to 40 cm. high, more slender than *D. spicata.*

Sheaths: Pilose at the throat, otherwise glabrous.

Inflorescence: A panicle, less dense than *D. spicata.*

Spikelets: 9- to 15-flowered, standing well apart and averaging longer and narrower than *D. spicata.*

Glumes: Subequal.

Lemmas: Firm, the palea a little shorter, much broader below, the keels with wide serrulate, erose or lacerate wings.

Distribution: Alkaline soil, Saskatchewan to British Columbia, south to Texas and California.

Distribution in British Columbia: Common on alkaline soils in the Interior.

27. *Echinochloa* Beauv.

Coarse annuals with flat blades, without ligules, having rather dense open panicles in which the spikelets are in a somewhat 1-sided cluster on the branches and are bristly or hispid. First glume about half the length of the spikelet; second glume and sterile lemma subequal in length, the latter awned. Fertile lemma smooth and shining, with enrolled margins below, partially enclosing the smooth palea.

KEY TO THE SPECIES OF ECHINOCHLOA

Racemes few, distant, appressed or ascending; leaf blades 2 to 6 mm. wide .... 1. *E. colunom*

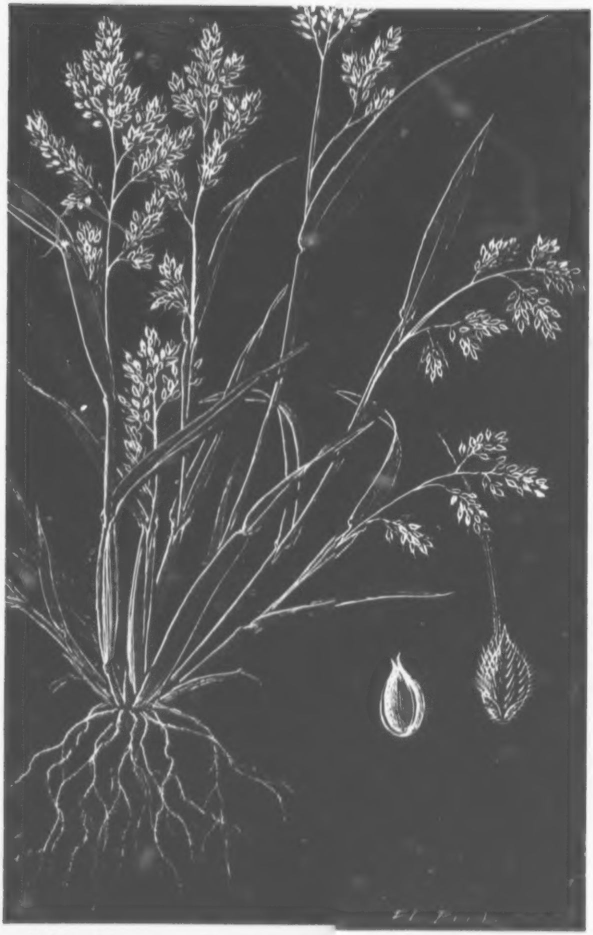
Racemes numerous, spreading or ascending and overlapping; leaf blades 6 to 20 cm. wide .... 2. *E. crusgalli*

1. *Echinochloa colonum* (L.) Link. Jungle-rice

Habit: Tufted annual.

Culms: Prostrate to erect, 20 to 40 cm. long.

Blades: Rather lax, 3 to 6 mm. wide, occasionally transversely zoned with purple.



Echinochloa crusgalli. Plant, × ¼; spikelet and floret, × 3.

Inflorescence: Slender panicles, 5 to 12 cm. long, with several alternate racemes often 1 cm. apart. Racemes erect or ascending, blunt, 1 to 2 cm. long.

Spikelets: Crowded and subsessile in 4 longitudinal rows, 2.5 to 3 mm. long, often obovoid, awnless.

Glumes: Second glume and sterile lemma uniformly pubescent, the hairs less than 0.5 mm. long. Fruit 2 to 2.5 mm. long, obtuse or acute.

Distribution: British Columbia south to California and widely distributed in most southern States.

Remarks: Native of the old world tropics, now widely dispersed as a weed in most tropical regions.

2. *Echinochloa crusgalli* (L.) Beauv. Barnyard Grass

Habit: Coarse tufted annual.

Culms: Erect to decumbent, stout, 1 to 1.5 mm. tall, often branching at base.

Sheaths: Glabrous.

Blades: Elongate, 5 to 15 mm. wide.

Inflorescence: An erect or nodding panicle, purple-tinged, 10 to 20 cm. long; racemes spreading, ascending or appressed, the lower somewhat distant, as much as 10 cm. long, sometimes branches, the upper approximate.

Spikelets: Crowded, about 3 mm. long, excluding the awns; internerves hispidulous.

Glumes: Second glume and sterile lemma short hispid on the nerves, the hairs not papillose, typically awnless. Fruit ovate, obtuse, usually 2.5 to 3.5 mm. long, the short beak withering.

Distribution: Moist open places, ditches, cultivated fields, and waste ground, British Columbia to New Brunswick south to Florida and California.

Distribution in British Columbia: Sidney, Harrison Lake, and Sumas.

Remarks: A native of Europe.

28. *Elymus* L. Wild-rye

Erect, usually rather tall perennials (one annual), with flat or rarely convolute blades and slender or bristly spikes, the spikelets usually crowded, sometimes somewhat distant. Spikelets 2- to 6-flowered, in pairs (3 or more or solitary sometimes in a few species) at each node of a usually continuous rachis, placed as in *Agropyron* but the rachilla distorted at base, bringing the florets more or less dorsiventral to the rachis; rachilla disarticulating above the glumes and between the florets; glumes equal, somewhat asymmetric, usually rigid, sometimes indurate below, narrow to subulate, 1- to several-nerved, acute to aristate; lemmas rounded on the back or nearly terete, obscurely 5-nerved, acute or usually awned from the tip.

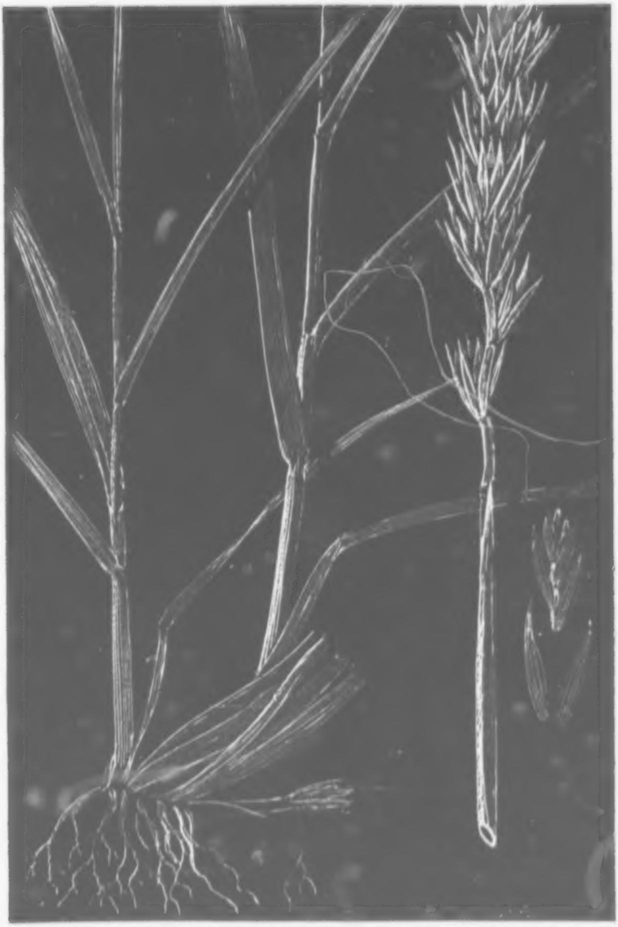
The seed of certain species (e.g., *E. mollis* and *E. canadensis*) have been used for food by the Indians.

The species of *Elymus* are for the most part good forage grasses and in some localities form a part of the native hay.

Besides the following native *Elymus* species which are dealt with in detail, there have been a number introduced for reseeding purposes. These include *E. arenarius* L., European dunegrass, which is very similar to *E. mollis* Trinn.; *E. junceus* Fisch., Russian wild-rye, which was introduced from Asia in 1927 and has since been used extensively for reseeding in the drier areas of the United States and Canada; *E. sibiricus* L., Siberian wild-rye, introduced from Russia and has been used with fair results in seeding tests in the Ponderosa pine areas. These are only a few of the many introduced species of *Elymus*.

KEY TO THE SPECIES OF ELYMUS

1*a*. Rhizomes present.
Glumes lanceolate, awnless or awn-pointed.
Plants of coastal dunes.
Glumes and lemmas papery, distinctly nerved .... 1. *E. mollis*
Glumes and lemmas firm, faintly nerved .... 2. *E. vancouverensis*
Glumes subulate or very narrow.
Lemmas awn or awn-tipped; spike 5 to 15 cm. long 3. *E. innovatus*
Lemmas awnless; spike 10 to 25 cm. long .... 4. *E. cinereus*
1*b*. Rhizomes wanting. Plants tufted.
Rachis tardily disjointing; glumes and lemmas awned . 5. *E. macounii*
Rachis continuous.
Glumes subulate to subsetaceous, not broadened above the base, the nerves obscure .... 4. *E. cinereus*
Glumes lanceolate or narrower, broadened above the base, strongly 3- to several-nerved.
Glumes relatively thin, flat, several-nerved, not indurate at the base.
Lemmas sparsely long-hirsute on the margins toward the summit .... 6. *E. hirsutus*
Lemmas glabrous or scabrous.
Lemmas awned .... 7. *E. glaucus*
Lemmas awnless or minutely awn-tipped .... 8. *E. virescens*
Glumes firm, indurate at base .... 9. *E. canadensis*



Elymus mollis. Plant, ×¼; spikelet and glumes, ×1½.

1. *Elymus mollis* Trin. American Dunegrass

Habit: Perennial with creeping rhizomes.
Culms: Stout, pubescent below the spike, glaucous, 60 to 120 cm. tall, with numerous overlapping basal leaves.
Blades: Firm, 7 to 12 mm. wide, often involute in drying.
Inflorescence: An erect spike, dense, thick, soft, pale, 7 to 25 cm. long.
Spikelets: 15 to 25 mm. long.
Glumes: Lanceolate, flat, many-nerved, scabrous or pubescent, 12 to 25 mm. long, acuminate, about as long as the spikelet.
Lemmas: Scabrous to felty-pubescent, acuminate or mucronate.
Distribution: Sand dunes along the coast, Alaska to Greenland, south to Long Island, New York and British Columbia to central California; along Lake Superior and Michigan; also eastern Siberia to Japan.
Distribution in British Columbia: Growing along the coastal areas.

2. *Elymus vancouverensis* Vas. Vancouver Wild-rye

Habit: Perennial with creeping rhizomes.
Culms: 8 to 12 dm. high, glabrous, or puberulent above, producing elongated rootstocks.
Sheaths: Glabrous.
Blades: 5 to 8 mm. wide, scabrous above, glabrous beneath, flat or partly involute.
Inflorescence: A somewhat interrupted spike, purplish, to 2 dm. long, stiffly erect.
Spikelets: 15 to 25 mm. long.
Glumes: Narrowly lanceolate, firm, gradually acuminate, 1 to 1.5 cm. long, sparsely long-villous, especially toward the apex.
Lemmas: Firm, 1 to 1.5 cm. long, tapering into a short awn.
Distribution: Dunes and sandy shores, British Columbia to northern California.
Distribution in British Columbia: Found along the seashore.

3. *Elymus innovatus* Beal

Habit: Perennial with creeping rhizomes.
Culms: Erect, slender, glabrous, 50 to 100 cm. tall, rhizomes slender, nearly vertical from deep slender horizontal rhizomes with brown scales.
Sheaths: Glabrous.
Blades: Firm, glabrous beneath, scabrous above, 2 to 5 mm. wide, flat or involute in drying.
Inflorescence: A rather dense spike, 5 to 12 cm. long, the rachis villous.
Spikelets: 1 to 1.5 cm. long.
Glumes: Narrow, densely purplish or greyish villous.
Lemmas: With an awn mostly 1 to 4 mm. long.

Distribution: Open and gravelly flats, Alaska to British Columbia, Montana, Wyoming, and South Dakota.
Distribution in British Columbia: Eastern and northern British Columbia.

4. *Elymus cinereus* Scribn. and Merr. Giant Wild-rye

Habit: Perennial, mostly without creeping rhizomes.
Culms: Robust, enlarged tufts, usually 2 to 3 m. tall.
Sheaths: Glabrous to densely harsh-puberulent.
Blades: Firm, strongly nerved, flat, mostly less than 15 mm. wide.
Inflorescence: An erect spike, dense, 10 to 25 cm. long, usually more or less compound, the branches erect, 2 to 7 cm. long.
Spikelets: Often in threes to fives, commonly distorted by pressure.
Glumes: Subulate, awn-pointed, usually 1-nerved or nerveless, about as long as the first lemma, sometimes longer.
Lemmas: More or less pubescent with a hyaline margin awnless or mucronate.
Ligule: 2 to 5 mm. long.
Distribution: River-banks, ravines, moist or dry slopes, and plains, Minnesota to British Columbia, south to California.
Distribution in British Columbia: Thompson River to the Rockies, and Cranbrook.

5. *Elymus macounii* Vasey. Macoun Wild-rye

Habit: Tufted perennial.
Culms: Erect, slender, 50 to 100 cm. tall.
Sheaths: Glabrous or rarely pubescent.
Blades: Erect, rather firm, subinvolute, usually scabrous on both surfaces, 10 to 20 cm. long, mostly 2 to 5 mm. wide.
Inflorescence: A slender spike, erect or somewhat nodding, 4 to 12 cm. long, usually about 5 mm. thick, the slender rachis tardily disarticulating.
Spikelets: Imbricate, appressed, mostly 2-flowered, about 1 cm. long, excluding the awns.
Glumes: Very narrow, scabrous, slightly divergent but not bowed out at base, the midnerve usually distinct.
Lemmas: Scabrous toward the apex, extending into slender straight awns 1 to 2 cm. long.
Distribution: Meadows and open ground, Minnesota to Alaska and British Columbia to California, east to Iowa and Kansas.
Distribution in British Columbia: Not common. Windermere, Anahim Lake, and Cariboo Highway.

6. *Elymus hirsutus* Presl.

Elymus borealis Scribn.
Habit: Tufted perennial.
Culms: Solitary or in small tufts, 50 to 140 cm. tall, rather weak.

Sheaths: Glabrous.

Blades: Flat, lax, 4 to 10 mm. wide, scabrous.

Inflorescence: A drooping spike, mostly loose, the rachis exposed.

Spikelets: Mostly about 15 mm. long.

Glumes: About 1 mm. wide, strongly nerved, awned.

Lemmas: Sparsely long-hirsute along the margin toward the summit, sometimes coarsely pubescent on the back, the slender awn flexuous or divergent, 1.5 to 2 cm. long.

Distribution: Moist woods or open ground, Alaska to Oregon.

Distribution in British Columbia: Monashee Mountains, Hope, Bute Inlet, and Arrow Lakes. Not common.

7. *Elymus glaucus* Buckl. Blue Wild-rye

Habit: Tufted perennial.

Culms: Loose to dense tufts, often bent at base, erect, 60 to 120 cm. tall, leafy.

Sheath: Smooth or scabrous.

Blades: Flat, usually lax, mostly 8 to 15 mm. wide, usually scabrous on both surfaces, sometimes narrow and subinvolute.

Inflorescence: A long-exserted spike, from erect to somewhat nodding, usually dense, commonly 5 to 20 cm. long, occasionally longer.

Spikelets: Appressed.

Glumes: Lanceolate at base, 8 to 15 mm. long, with 2 to 5 strong scabrous nerves, acuminate or awn-pointed.

Lemmas: Awned, the awn 1 to 2 times as long as the body, erect to spreading.

Distribution: Open woods and dry hills at low and medium altitudes, Ontario and Michigan to southern Alaska, south through British Columbia to South Dakota, Colorado, New Mexico, and California.

Distribution in British Columbia: Vancouver Island, Manning Park, Garibaldi, and Kimberley.

Remarks: Exceedingly variable species.

8. *Elymus virescens* Piper. Pacific Wild-rye

Habit: Tufted perennial.

Culms: 3 to 12 dm. high.

Sheaths: Glabrous to retrorsely pubescent.

Blades: 2 to 12 mm. wide, glabrous to harsh-puberulent.

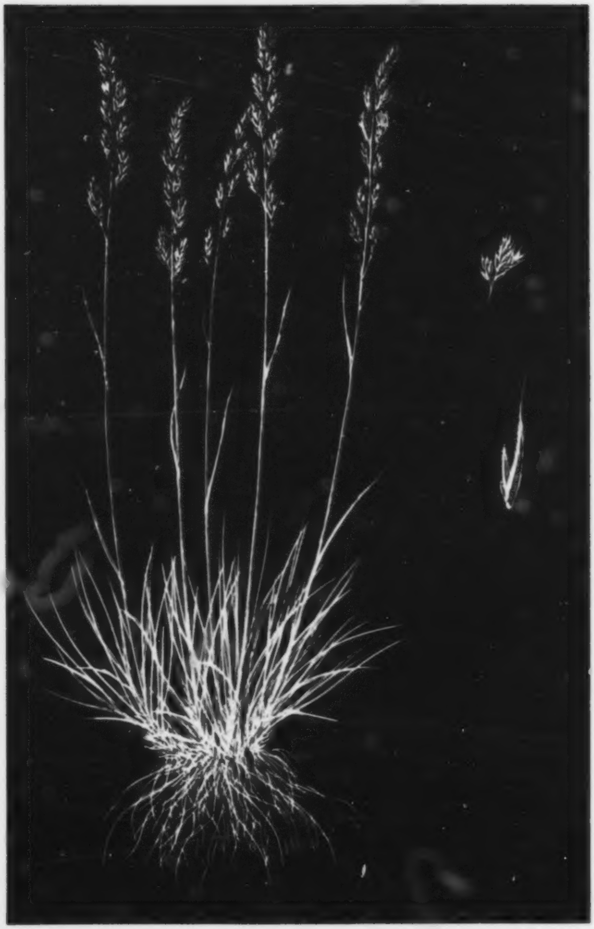
Inflorescence: A spike 5 to 15 cm. long, dense.

Spikelets: Imbricate.

Glumes: Flat, 1 to 2 mm. wide, strongly nerved, pointed or awn-tipped.

Lemmas: Glabrous to scabrous, barely awn-tipped or with an awn 1 to 4 mm. long.

Distribution: Moist woods from southern Alaska through British Columbia to California.



Festuca ovina. Plant, × ½; spikelet and floret, × 2.

4

Distribution in British Columbia: Victoria.
Remarks: Resembling *E. glaucus* and nearly as variable in habit.

9. *Elymus canadensis* L. Canada Wild-rye

Habit: Tufted perennial, often glaucous or green.
Culms: Erect, tufted, mostly 1 to 1.5 m. tall.
Sheaths: Glabrous or rarely pubescent.
Blades: Flat, scabrous or sparsely hispid on the upper surface, mostly 1 to 2 cm. wide.
Inflorescence: A thick and bristly spike, nodding or drooping, often interrupted below, 10 to 25 cm. long, sometimes glaucous.
Spikelets: Commonly in threes or fours, slightly spreading.
Glumes: Narrow, mostly 2- to 4-nerved, scabrous, sometimes hispid but less so than the lemmas, the bases somewhat indurate and divergent but scarcely bowed out, the awn about as long as the body.
Lemmas: Scabrous-hirsute to hirsute-pubescent, rarely glabrous, strongly nerved above, the awn divergently curved when dry, 2 to 3 cm. long.
Distribution: River-banks, open ground, and sandy soil, Quebec to southern Alaska, south to North Carolina, Missouri, Texas, Arizona, and northern California.
Distribution in British Columbia: The Interior.

29. *Festuca* L. Fescue

Annual or perennials with mostly narrow leaves and narrow or open exserted panicles or racemes.

Many of the perennial species of fescue are important forage grasses in the grazing regions of the west. *Festuca ovina,* sheep fescue, is an excellent grazing grass; its variety *brachyphylla,* alpine fescue, furnishes much of the forage above timber-line from the Rocky Mountains westward.

The most important cultivated species is *F. elatior,* meadow fescue, a native of Europe, which is used for hay and pastures.

The group of fescues in this Province can be divided into two main groups: first, those plants that are annual, and, secondly, those that are perennial.

KEY TO THE SPECIES OF FESTUCA

1*a*. Plants annual.
Spikelets mostly more than 5-flowered. Lemmas 4 to 5 mm. long, the margin inrolled, not scarious .... 1. *F. octoflora*
Spikelets mostly less than 5-flowered. Lemmas usually scarious margined.

Panicle narrow, the branches appressed.
Lemmas ciliate toward apex .... 2. *F. megalura*
Lemmas not ciliate.
First glume ⅔ to ¾ as long as the second .... 3. *F. dertonensis*
First glume shorter than second, 1 to 2 mm. long 4. *F. myuros*
Panicle rather short, the branches and often the spikelets spreading.
Pedicels appressed; lower branches of the panicle usually finally reflexed; spikelets usually 3- to 5-flowered ...... 5. *F. pacifica*
Pedicels or nearly all of them finally reflexed, notably those of the upper part of the main axis, branches of the panicle reflexed; spikelets 1- to 2-flowered .... 6. *F. reflexa*
1*b*. Plants perennial.
Blades flat, rather soft and lax, mostly more than 3 mm. wide.
Lemmas awned, awn more than 2 mm. long.
Floret with a minute stalk .... 7. *F. subuliflora*
Floret without a stalk .... 8. *F. subulata*
Lemmas awnless .... 9. *F. elatior*
Blades involute, or if flat less than 3 mm. wide.
Culms decumbent .... 10. *F. rubra*
Culms erect.
Lemmas 7 to 10 mm. long. Scabrous, culms densely tufted.
Panicle narrow .... 11. *F. scabrella*
Panicle loose and open .... 12. *F. altaica*
Lemmas mostly not more than 7 mm. long.
Lemmas awnless.
Lemmas 6 to 7 mm. long .... 13. *F. viridula*
Lemmas about 3 mm. long .... 14. *F. capillata*
Lemmas awned.
Awn as long as or longer than body of the lemma; blades soft, glabrous .... 15. *F. occidentalis*
Awn shorter than body of the lemma; blades slender, scabrous.
Blades mostly not more than ½ as long as the culms; panicle mostly less than 10 mm. long .... 16. *F. ovina*
Blades elongate, panicle 10 to 20 cm. long .... 17. *F. idahoensis*

1. *Festuca octoflora* Walt. Six-weeks Fescue

Habit: Annual.
Culms: Erect, usually 15 to 30 cm. tall, sometimes as much as 60 cm. tall.
Sheaths: Glabrous.
Blades: Narrow, involute. 2 to 10 cm. long.
Inflorescence: A narrow panicle, the branches short, appressed or spreading.
Spikelets: 6 to 8 mm. long, densely 5- to 13-flowered.
Glumes: Subulate-lanceolate, the first 1-nerved, the second 3-nerved, 4 to 4.5 mm. long.

Lemmas: Firm, convex, lanceolate, glabrous or scabrous, 4 to 5 mm. long, the margins not scarious; awn commonly 3 to 5, sometimes to 7 mm. long.

Distribution: Open sterile ground, New York to Florida, Illinois, Kansas, and Texas. From British Columbia to Idaho and Washington.

Distribution in British Columbia: Coldwater River, Osoyoos, Penticton, Creston, and Nelson.

2. *Festuca megalura* Nutt. Foxtail Fescue

Habit: Annual.

Culms: 20 to 60 cm. tall.

Sheaths: Glabrous.

Blades: Narrow and glabrous.

Inflorescence: A narrow panicle, 7 to 20 cm. long, the branches appressed.

Spikelets: 4- or 5-flowered.

Glumes: First glume 1.5 to 2 mm. long, the second 4 to 5 mm. long.

Lemmas: Linear-lanceolate, scabrous on the back especially toward the apex, ciliate on the upper half; awn 8 to 10 mm. long.

Distribution: Open sterile ground, British Columbia to California, east to Montana and Arizona.

Distribution in British Columbia: Vancouver Island and Vancouver.

3. *Festuca dertonensis* (All.) Aschers. and Graebn.

Festuca bromoides L.

Habit: A slender, tufted annual.

Culms: 2 to 5 dm. high, erect or more often decumbent below.

Sheaths: Glabrous.

Blades: Short, filiform-involute.

Inflorescence: Narrow panicle, 5 to 10 cm. long, one-sided, with short erect branches.

Spikelets: 5- to 8-flowered, 9 to 11 mm. long.

Glumes: Narrow, acuminate, the first 3 to 4 mm. long, the second about 7 mm. long.

Lemmas: Scabrous toward the apex, 7 to 8 mm. long; awns 10 to 12 mm. long.

Distribution: Dry hills and meadows, British Columbia to southern California, Arizona, and Texas. This species has been introduced from Europe.

Distribution in British Columbia: Vancouver Island, Ladner, Vancouver, and Penticton.

4. *Festuca myuros* L.

Habit: Slender tufted annual.

Culms: 20 to 60 cm. tall.

Sheaths: Glabrous.

Blades: Narrow and glabrous.
Inflorescence: A panicle usually smaller than *F. dertonensis.*
Spikelets: 5- to 8-flowered, 9 to 11 mm. long.
Glumes: First glume 1 to 1.5 mm., the second 4 to 5 mm. long.
Lemmas: Margins of the lemmas not ciliate.
Distribution: Plentiful along the coast from British Columbia to California. Introduced from Europe.
Distribution in British Columbia: Along the coast.

5. *Festuca pacifica* Piper

Habit: Annual.
Culms: Erect or geniculate at base, 30 to 60 cm. tall.
Sheaths: Glabrous.
Blades: Soft, loosely involute, glabrous, 3 to 5 cm. long.
Inflorescence: A panicle 5 to 12 cm. long, the lower branches solitary, somewhat distant, spreading, 1 to 3 cm. long.
Spikelets: 3- to 6-flowered.
Glumes: First glume subulate-lanceolate, about 4 mm. long, the second lanceolate-accuminate, about 5 mm. long.
Lemmas: Lanceolate, glabrous or scaberulous, 6 to 7 mm. long; awn 10 to 15 mm. long.
Distribution: Open ground, mountain slopes, and open woods, British Columbia to California, east to western Montana and New Mexico.
Distribution in British Columbia: Along the coast.

6. *Festuca reflexa* Buckl. Few-flowered Fescue

Habit: Tufted annual.
Culms: 20 to 40 cm. tall.
Sheaths: Glabrous or pubescent.
Blades: Narrow, flat to subinvolute, 2 to 10 cm. long.
Inflorescence: A panicle 5 to 12 cm. long, the solitary branches and the spikelets all at length divaricate.
Spikelets: Mostly 1- to 3-flowered, 5 to 7 mm. long.
Glumes: First glume 2 to 4 mm. long, the second 4 to 5 mm. long.
Lemmas: Glabrous or scaberulous, 5 to 6 mm. long; awn usually 5 to 8 mm. long.
Distribution: Rocky slopes and wooded hills, British Columbia, Washington, to southern California, east to Arizona and Utah.
Distribution in British Columbia: Goldstream and Black Mountain.

7. *Festuca subuliflora* Scribn.

Habit: Perennial.
Culms: Erect, slender, 60 to 100 cm. tall.
Sheaths: Scabrous-puberulent.

Blades: Flat, lax, pubescent on the upper surface, those of the culm mostly 2 to 4 mm. wide, those of the innovations narrower.

Inflorescence: A loose panicle, lax, 10 to 20 cm. long, nodding, the branches drooping, the lower naked at the base.

Spikelets: Loosely 3- to 5-flowered, the rachilla pubescent or hispid, the internodes of the rachilla as much as 2 mm. long; floret long-stipitate, the rachilla appearing to be jointed a short distance below the floret.

Glumes: Very narrow, acuminate, the first 3 to 4 mm., the second 4 to 5 mm. long.

Lemmas: Scaberulous toward the apex, 6 to 8 mm. long; awn somewhat flexuous, 10 to 15 mm. long.

Distribution: Moist shady places from sea-level to 3,500 feet, British Columbia to northern California, mostly near the coast.

Distribution in British Columbia: Vancouver Island, rare on the mainland.

8. *Festuca subulata* Trin. Bearded Fescue

Habit: Perennial.

Culms: Erect, mostly 50 to 100 cm. tall.

Sheaths: Glabrous or slightly scabrous.

Blades: Flat, thin, lax, 3 to 10 mm. wide.

Inflorescence: Loose open panicle, drooping, 15 to 40 cm. long, the branches mostly in twos or threes, naked below, finely spreading or reflexed, the lower as much as 15 cm. long.

Spikelets: Loosely 3- to 5-flowered.

Glumes: Narrow, acuminate, the first about 3 mm., the second about 5 mm. long.

Lemmas: Somewhat keeled, scaberulous toward the apex, the intermediate nerves obscure, the tip attenuate into an awn 5 to 20 mm. long.

Distribution: Moist woods at moderate to rather high altitudes, Alaska, British Columbia to northern California, east to Wyoming.

Distribution: Frequent in the Vancouver area.

9. *Festuca elatior* L. Meadow Fescue

Habit: Perennial.

Culms: 50 to 120 cm. tall.

Sheaths: Glabrous.

Blades: Flat, 4 to 8 mm. wide, scabrous above.

Inflorescence: An erect panicle, sometimes nodding at the summit, 10 to 20 cm. long, contracted after flowering, much branched or nearly simple, the branches spikelet-bearing nearly to base.

Spikelets: Usually 6- to 8-flowered, 8 to 12 mm. long.

Glumes: 3 to 4 mm. long, lanceolate.

Lemmas: Oblong-lanceolate, coriaceous, 5 to 7 mm. long, the scabrous apex acutish, rarely short-awned.

Distribution: Meadows, roadsides, and waste places throughout the cooler parts of North America.

Distribution in British Columbia: Mayne Island, Prince George, Ootsa Lake, and Cowichan Bay.

Remarks: A native of Eurasia. Cultivated for meadows and pastures. A highly palatable grass, sometimes called English bluegrass.

10. *Festuca rubra* L. Red Fescue

Habit: Tufted perennial.

Culms: Bent or decumbent at the reddish or purplish base, occasionally closely tufted, erect to ascending, 40 to 100 cm. tall.

Sheaths: The lower sheaths brown, thin, and fibrillose.

Blades: Smooth, soft, usually folded or involute.

Inflorescence: A panicle 3 to 20 cm. long, usually contracted and narrow, the branches mostly erect or ascending.

Spikelets: 4- to 6-flowered, pale green or glaucous, often purple-tinged.

Glumes: Nearly glabrous, lanceolate, the second nearly twice as long as the first.

Lemmas: 5 to 7 mm. long, smooth, or scabrous toward apex, bearing an awn about half as long.

Distribution: Generally distributed in open ground at moderate altitudes over most of the United States and Canada.

Distribution in British Columbia: Vancouver Island, Vancouver, Smithers, and Goose Island.

Remarks: Occasionally used in grass mixtures for pastures. Some forms introduced.

11. *Festuca scabrella* Torr. Rough Fescue

Festuca hallii (Vasey) Piper.

Habit: Densely tufted perennial.

Culms: Erect, 30 to 90 cm. tall.

Sheaths: Loose, scabrous, much longer than the internodes.

Blades: Firm, erect, scabrous, involute, or those of the culms sometimes flat but narrow.

Inflorescence: Narrow panicle, 5 to 15 cm. long, the branches solitary or in pairs, the lowermost sometimes in threes, appressed or ascending, naked below.

Spikelets: 4- to 6-flowered.

Glumes: Somewhat unequal, lanceolate, 7 to 9 mm. long.

Lemmas: Firm, rather strongly nerved, scaberulous, acute to cuspidate or short-awned, 7 to 10 mm. long.

Distribution: Prairies, hillsides, and open woods, up to 6,500 feet, Newfoundland to British Columbia, south to Oregon, North Dakota, and Colorado.

Distribution in British Columbia: Abundant in eastern British Columbia.

12. *Festuca altaica* Trin.

Habit: Perennial, forming dense tufts.
Culms: Erect, smooth, 30 to 100 cm. tall.
Blades: Narrow, involute, 15 to 30 cm. long.
Inflorescence: A loose open panicle, 10 to 20 cm. long.
Spikelets: 10 to 15 mm. long, 3- to 5-flowered, usually suffused with purple.
Glumes: Unequal, nearly smooth.
Lemmas: Ovate, attenuate, finely and densely scaberulous, 7 to 11 mm. long, usually with a short awn.
Distribution: Alaska and British Columbia.
Distribution in British Columbia: Telegraph Creek and Omineca Mountain.

13. *Festuca viridula* Vasey. Green-leaf Fescue

Habit: Perennial.
Culms: Erect, 50 to 100 cm. tall.
Sheaths: Glabrous.
Blades: Soft, erect, those of the culm flat or loosely involute, those of the innovations slender, involute.
Inflorescence: An open panicle, 10 to 15 cm. long, the branches mostly in pairs, ascending or spreading, slender, somewhat remote, naked below.
Spikelets: 3- to 6-flowered.
Glumes: Lanceolate, somewhat unequal, 5 to 7 mm. long.
Lemmas: Membranaceous, acute or cuspidate, glabrous, 6 to 8 mm. long.
Distribution: Mountain meadows and open slopes, 3,000 to 7,000 feet, British Columbia to Alberta, south to central California and Idaho.
Distribution in British Columbia: Mount Kokanee and Nelson at 6,000 feet, also Manning Park.
Remarks: An important forage grass in the mountains of the north-western States.

14. *Festuca capillata* Lam. Hair Fescue

Habit: Densely tufted perennial.
Culms: Loosely clustered, very slender and glabrous, 40 to 80 cm. high.
Sheaths: Glabrous.
Blades: Very narrowly filiform-involute, slightly pubescent above.
Inflorescence: A panicle, 4 to 8 cm. long, the branches few and short.
Spikelets: 4 to 5 mm. long, 3- to 6-flowered.
Glumes: First glume 1-nerved, about 2 mm. long, the second 3-nerved and usually twice as long.
Lemmas: Glabrous, very obscurely nerved, 3 to 3.5 mm. long, awnless.
Distribution: Lawns and waste places, Newfoundland to North Carolina, Minnesota, British Columbia to Oregon.
Distribution in British Columbia: Vancouver.

15. ***Festuca occidentalis*** **Hook. Western Fescue**

Habit: Closely tufted perennial.

Culms: Erect, slender, 40 to 100 cm. tall.

Sheaths: Smooth.

Blades: Mostly basal, slender, involute, soft, smooth or nearly so.

Inflorescence: A loose panicle, 7 to 20 cm. long, often drooping above, the branches solitary or in pairs.

Spikelets: Loosely 3- to 5-flowered, 6 to 10 mm. long, mostly on slender pedicles.

Glumes: Broadly lanceolate, soft, glabrous, the lower 3 to 4 mm. long, the upper 4 to 5 mm. long.

Lemmas: Rather thin, 5 to 6 mm. long, scaberulous toward the apex, attenuate into a slender awn about as long or longer.

Distribution: Dry rocky wooded slopes and banks, British Columbia to central California, east to Wyoming, northern Michigan and western Ontario.

Distribution in British Columbia: Vancouver Island, Prince George, Manning Park, and the Cariboo.

16. ***Festuca ovina*** **L. Sheep Fescue**

Habit: Densely tufted perennial.

Culms: 20 to 40 cm. tall.

Sheaths: Glabrous.

Blades: Slender, involute, from very scabrous to glabrous, the innovations in a basal cluster, 5 to 10 cm. long or sometimes longer.

Inflorescence: A narrow panicle, sometimes almost spike-like, 5 to 10 cm. long.

Spikelets: Mostly 4- to 5-flowered.

Lemmas: About 4 to 5 mm. long, short-awned.

Distribution: Dry open woods, British Columbia south to Arizona and New Mexico east to North Dakota.

Distribution in British Columbia: Vancouver Island, Kelowna, Chilcotin, and Lac la Hache.

Remarks: *F. ovina* var. *brachyphylla* (Schult.) Piper. An alpine and high northern form differing in the lower culms, mostly 5 to 20 cm. tall, and the smooth short rather lax blades. *F. brachyphylla* Schult.; *F. ovina* var. *supina* Hack of Piper's revision of *Festuca*. Rocky slopes, at high altitudes, mostly above timber-line.

17. ***Festuca idahoensis*** **Elmer. Idaho Fescue**

F. ovina var. *ingrata* Hack.

Habit: Densely tufted perennial.

Culms: 30 to 100 cm. tall.

Sheaths: Glabrous.

Blades: Numerous, usually elongate, very scabrous, rarely smooth, filiform, involute.
Inflorescence: A narrow panicle, 10 to 20 cm. long, the branches ascending or appressed, somewhat spreading in anthesis.
Spikelets: Mostly 5- to 7-flowered.
Glumes: Narrow and acute, the second nearly twice as long as the first.
Lemmas: Nearly terete, about 7 mm. long; awn usually 2 to 4 mm. long.
Distribution: Open woods and rocky slopes, British Columbia to Alberta, south to central California and Colorado.
Distribution in British Columbia: South-eastern British Columbia.

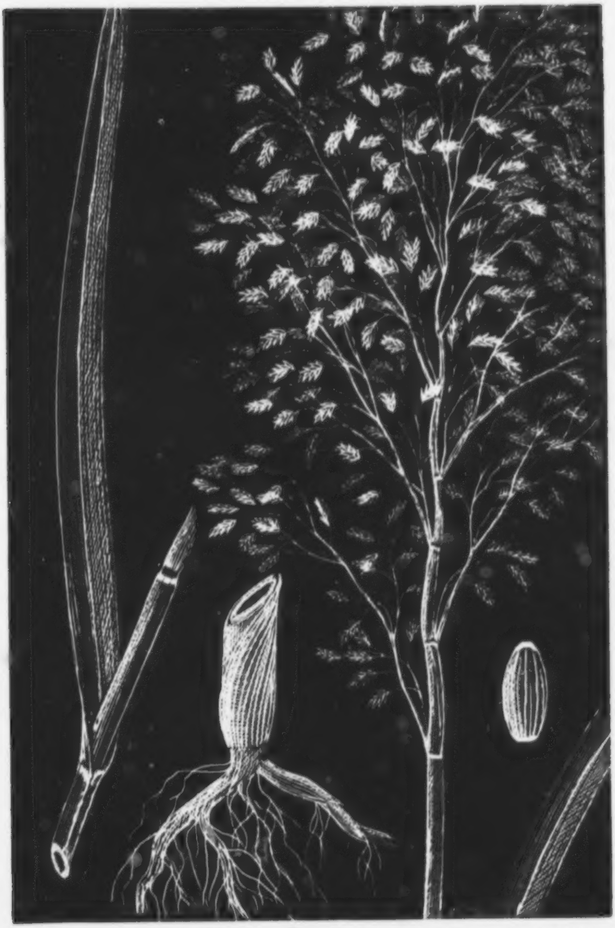
30. *Glyceria* R. Br. Mannagrass

Perennial, mostly tall grasses of fresh-water marshes; with culms often rooting at the base and sometimes rhizomatous, flat blades, and exserted open or narrow panicles. Spikelets several-flowered, rounded or laterally compressed, the articulation above the glumes and between the florets. Glumes unequal, shorter than the lemmas, obtuse or acute, usually 1-nerved. Lemmas convex on the back, firm, usually obtuse, with 5 to 9 strong, rib-like, parallel nerves.

All of the British Columbia species of mannagrass are palatable but are limited in distribution as they are found mainly around marshes and sloughs. They are readily grazed by stock but are probably more often eaten as hay.

KEY TO THE SPECIES OF GLYCERIA

Spikelets linear, nearly terete, usually 1 cm. long or more, appressed on short pedicels; panicles narrow erect.
  Lemmas glabrous between the slight scabrous nerves .... 1. *G. borealis*
  Lemmas scaberulous or hirtellous between the usually distinctly scabrous nerves.
    Lemmas about 3 mm. long, broadly rounded at the summit .... 2. *G. leptostachya*
    Lemmas 4 to 7 mm. long .... 3. *G. occidentalis*
Spikelets ovate or oblong, more or less compressed, usually not more than 5 mm. long; panicles usually nodding.
  Lemmas with 7 usually prominent nerves; second glume 1-nerved; sheaths, at least the upper, closed from below the summit.
    First glume not more than 1 mm. long.
      Blades 2 to 4 mm. wide, sometimes to 8 mm., rather firm, often folded; first glume 0.5 mm. long .... 4. *G. striata*



Glyceria grandis. Plant sections and panicle, ×1; floret, ×3.

Blades 6 to 12 mm. wide, flat, then lax; first glume about 1 mm. long .... 5. *G. elata*

First glume more than 1 mm. long, usually about 1.5 mm. long.

Lemmas gradually narrowed to a firm blunt apex; glumes acute .... 6. *G. grandis*

Lemmas with broad scarious margins; glumes obtuse ... 7. *G. pulchella*

Lemmas with 5 prominent nerves; second glume 3-nerved; sheaths open, panicle open .... 8. *G. pauciflora*

1. *Glyceria borealis* (Nash) Batchelder. Northern Mannagrass

Habit: Perennial.
Culms: Erect or decumbent at base, slender, 60 to 100 cm. tall.
Sheaths: Slightly scabrous.
Blades: Flat or folded, usually 2 to 4 mm. wide, sometimes wider.
Inflorescence: A panicle, mostly 20 to 40 cm. long, the branches as much as 10 cm. long, bearing several oppressed spikelets.
Spikelets: Mostly 6- to 12-flowered, 1 to 1.5 cm. long.
Glumes: About 1.5 and 3 mm. long.
Lemmas: Rather thin, obtuse, 3 to 4 mm. long, strongly 7-nerved, scarious at tip, glabrous between the nerves.
Distribution: Wet places and shallow water, Newfoundland to British Columbia, Pennsylvania to Illinois, Minnesota, and Washington.
Distribution in British Columbia: Victoria, Smithers, Creston Flats, and Vanderhoof.

2. *Glyceria leptostachya* Buckl.

Panicularia davyi Merr.
Habit: Perennial.
Culms: 1 to 1.5 m. tall, rather stout.
Sheaths: Slightly rough.
Blades: Flat, scaberulous on the upper surface, 4 to 7 mm. wide.
Inflorescence: A panicle 20 to 40 cm. long, the branches ascending mostly in twos or threes, several-flowered, often bearing secondary branchlets.
Spikelets: 1 to 2 cm. long, 8- to 14-flowered, often purplish.
Glumes: 1.5 and 3 mm. long.
Lemmas: Firm, broadly rounded toward apex, about 3 mm. long, 7-nerved, scaberulous on the nerves and between them.
Distribution: Shallow water, British Columbia to central California. Rare.
Distribution in British Columbia: Alberni.

3. *Glyceria occidentalis* (Piper) J. C. Nels.

Habit: Perennial.
Culms: Flaccid, 60 to 100 cm. tall.
Sheaths: Glabrous.

Blades: 3 to 12 mm. wide, smooth beneath, somewhat scabrous on the upper surface.

Inflorescence: A loose panicle, spreading at anthesis, 30 to 50 cm. long.

Spikelets: 1.5 to 2 cm. long.

Glumes: First glume, mostly about 2 mm. long.

Lemmas: Usually tinged with purple near the tip, 4 to 6 mm. long, rather strongly scabrous, 7- to 9-nerved, the nerves prominent, raised above the tissue of the internerves; palea about as long as its lemma, sometimes slightly exceeding.

Distribution: Marshes and wet places, Idaho to British Columbia, northern California and Nevada.

Distribution in British Columbia: Chilliwack.

Remarks: The seeds are used for food by the Indians.

4. *Glyceria striata* (Lam.) Hitchc. Fowl Mannagrass

Glyceria nervata Trin.

Habit: Perennial.

Culms: Pale green, erect, slender, rather firm, 30 to 100 cm. tall.

Sheaths: Glabrous.

Blades: Erect or ascending, flat or folded, moderately firm, usually 2 to 6 mm. wide.

Inflorescence: An ovid panicle, open, 10 to 20 cm. long, nodding, the branches ascending at the base, drooping, naked below.

Spikelets: Ovate or oblong, 3- to 7-flowered, 3 to 4 mm. long, often purplish, somewhat crowded toward the ends of the branchlets.

Glumes: About 0.5 and 1 mm. long, ovate, obtuse.

Lemmas: Oblong, prominently 7-nerved, about 2 mm. long, the scarious tip inconspicuous; palea rather firm, about as long as the lemma, the smooth keels prominent, bowed out.

Distribution: Moist meadows and wet places, Newfoundland to British Columbia, south to Florida and northern California.

Distribution in British Columbia: Lac la Hache, Quesnel, Clinton, and Vancouver.

5. *Glyceria elata* (Nash) Hitchc. Tall Mannagrass

Panicularia nervata elata Piper.

Habit: Tufted perennial.

Culms: 1 to 2 m. tall, rather succulent.

Sheaths: Scabrous.

Blades: Flat, thin, lax, 6 to 12 mm. wide.

Inflorescence: An oblong panicle, 15 to 30 cm. long, the branches spreading, the lower often reflexed.

Spikelets: 6- to 8-flowered, 4 to 6 mm. long.

Glumes: First about 1 mm. long, the second nearly 2 mm.

Lemmas: Commonly narrow, scarious at the apex.

Distribution: Wet meadows, springs, and shady moist woods, Montana to British Columbia, south in the mountains to New Mexico and California.
Distribution in British Columbia: Jordan Meadows.

6. *Glyceria grandis* S. Wats. American Mannagrass

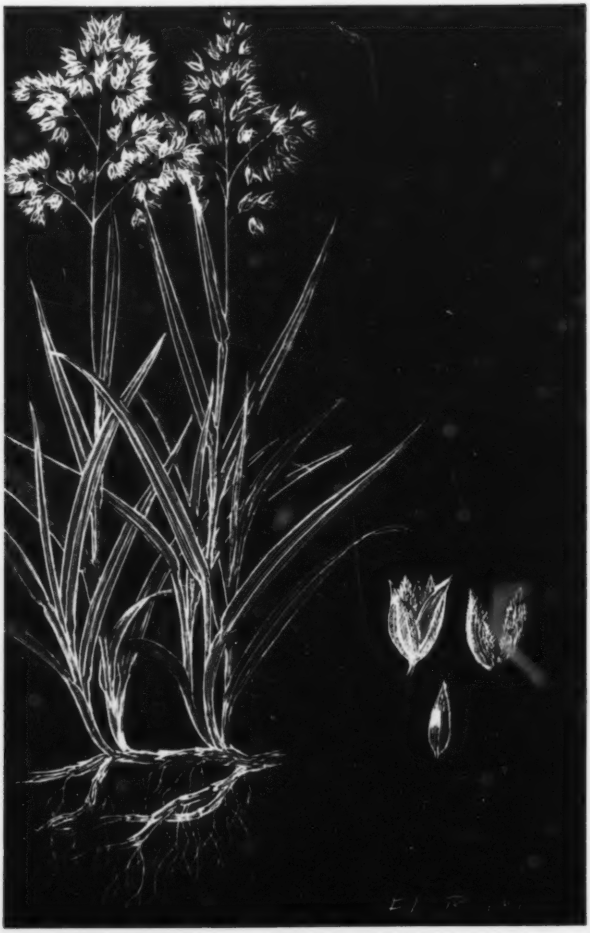
Panicularia americana MacM.
Habit: Tufted perennial.
Culms: Stout, 1 to 1.5 m. tall.
Sheaths: Scabrous.
Blades: Flat, 6 to 12 mm. wide.
Inflorescence: A large panicle, very compound, 20 to 40 cm. long, open, nodding at summit.
Spikelets: 4- to 7-flowered, 5 to 6 mm. long.
Glumes: Whitish, about 1.5 and 2 mm. long.
Lemmas: Purplish, about 2.5 mm. long.
Palea: Rather thin, about as long as the lemma.
Distribution: Banks of streams, marshes, and wet places, British Columbia to Prince Edward Island, south to Virginia and Arizona.
Distribution in British Columbia: Vancouver Island, Manning Park, Vanderhoof, and Burns Lake.

7. *Glyceria pulchella* (Nash) K. Schum

Habit: Tufted perennial.
Culms: 40 to 60 cm. high.
Sheaths: Scabrous.
Blades: 2.5 to 6 mm. wide.
Inflorescence: A panicle less than 18 cm. long, branches nodding slightly.
Spikelets: Oblong.
Glumes: Obovate, finely erose.
Lemmas: Broadly scabrious-margined.
Distribution: Alaska, northern British Columbia, and Alberta.
Distribution in British Columbia: Probably only in northern British Columbia.

8. *Glyceria pauciflora* Presl.

Habit: Perennial.
Culms: 50 to 120 cm. tall.
Sheaths: Open, smooth or scaberulous, sometimes inflated in floating plants.
Blades: Thin, flat, lax, scaberulous, mostly 10 to 15 cm. long, 5 to 15 mm. wide.
Inflorescence: A panicle, open or rather dense, nodding, 10 to 20 cm. long, the branches ascending or spreading, rather flexuous, the spikelets crowded on the upper half, the lower most usually 2 to 4.
Spikelets: Mostly 5- or 6-flowered, 4 to 5 mm. long, often purplish.
Glumes: Broadly ovate or oval, about 1 and 1.5 mm. long, the margins erose-scarious, the second 3-nerved.



Hierochloe odorata. Plant, ×⅓; spikelet, florets, and fertile floret, ×2½.

Lemmas: Oblong, 2 to 2.5 mm. long, with 5 prominent nerves and an outer short faint pair near the margins, scaberulous on the nerves and somewhat so between them, the tip rounded, scarious, and somewhat erose.

Distribution: Shallow water, marshes, and wet meadows, Alaska, British Columbia, south to California, and east to South Dakota.

Distribution in British Columbia: Vancouver Island, Driftwood River, Smithers, and Nelson.

31. *Hierochloe* R. Br.

Spikelets with 1 terminal perfect floret and 2 staminate florets, disarticulating above the glumes, the staminate florets falling attached to the fertile lemmas about as long as the glumes, boat-shaped, hispidulous, hairy along the margin; fertile lemma somewhat indurate, about as long as the others, smooth or nearly so, awnless; palea 3-nerved, rounded on the back. Perennial, erect, slender, sweet-smelling grasses, with small panicles of broad, bronze-coloured spikelets.

KEY TO THE SPECIES OF HIEROCHLOE

Staminate lemmas bearing exserted awns	1. *H. alpina*
Staminate lemmas awnless or nearly so	2. *H. odorata*

1. *Hierochloe alpina* (Swartz) Roem. and Schult

Habit: Perennial.

Culms: 10 to 40 cm. tall, tufted, with leafy shoots at base and short rhizomes.

Sheaths: Smooth.

Blades: 1 to 2 mm. wide, the basal ones elongate, those of the culms shorter and wider.

Inflorescence: A contracted panicle, 3 to 4 cm. long.

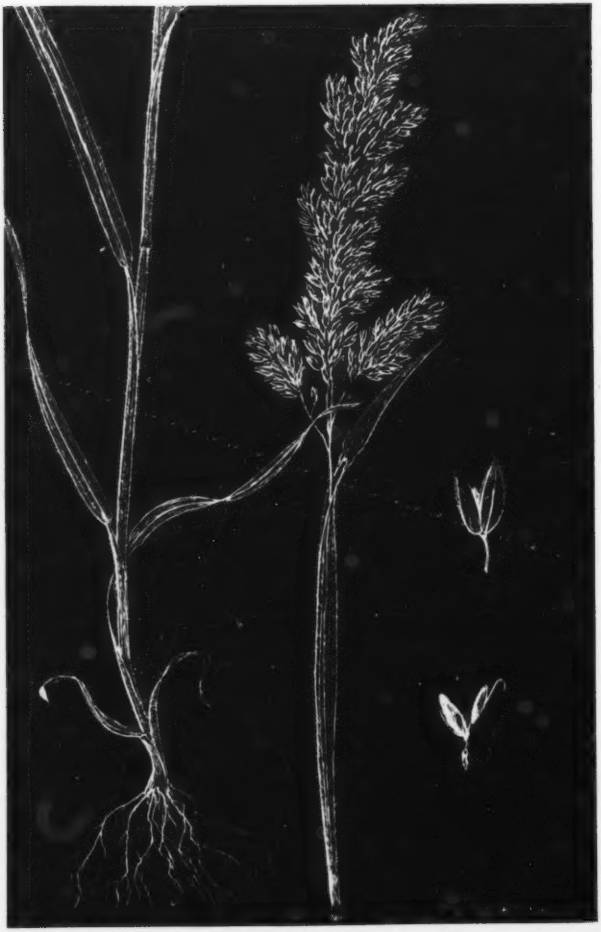
Spikelets: Short-pediceled, 6 to 8 mm. long.

Glumes: 6 to 8 mm. long.

Lemmas: Staminate lemmas ciliate on the margin, awned below the tip, the awn of the second lemma 5 to 8 mm. long, bent, twisted below, that of the first a little shorter, straight; fertile lemma acute, appressed-pubescent toward apex.

Distribution: Arctic regions, Alaska, British Columbia, to Newfoundland on the east and south to Montana.

Distribution in British Columbia: Telegraph Creek, McBride, and Tuya Lake.



Holeus lanatus. Plant, ×⅓; spikelet and floret, ×2.

2. *Hierochloe odorata* (L.) Beauv. Sweetgrass

Habit: Perennial.

Culms: 30 to 60 cm. tall, with few to several leafy shoots and slender, creeping rhizomes.

Sheaths: Smooth.

Blades: 2 to 5 mm. wide, sometimes wider, those of the sterile shoots elongate, those of the culm mostly less than 5 cm. long, rarely to 10 cm. long.

Inflorescence: Pyramidal-panicle, 4 to 12 cm. long, from somewhat compact to loose with slender drooping branches.

Spikelets: Mostly short-pediceled, 5 mm. long.

Glumes: Ovate, 4 to 6 mm. long.

Lemmas: Staminate lemmas awnless or nearly so, fertile lemma pubescent toward the apex.

Distribution: Meadows, bogs, and moist places, Alaska south to Indiana, Oregon, and in the mountains to New Mexico.

Distribution in British Columbia: Widely distributed but rarely abundant.

Remarks: The Indians used the grass, known as Seneca grass, to make fragrant baskets.

32. *Holcus* L.

Perennials with flat blades and contracted panicles. Spikelets 2-flowered, the pedicel disarticulating below the glumes, the rachilla curved and somewhat elongate below the first floret, not prolonged above the second floret; glumes about equal, longer than the 2 florets; first floret perfect, the lemma awnless; second floret staminate, the lemma bearing on the back a short awn.

KEY TO THE SPECIES OF HOLCUS

Rhizomes wanting .... 1. *H. lanatus*
Rhizomes present .... 2. *H. mollis*

1. *Holcus lanatus* L. Velvet Grass

Habit: Perennial.

Culms: Erect, 30 to 100 cm. tall, rarely taller.

Sheaths: Soft-pilose.

Blades: 4 to 8 mm. wide.

Inflorescence: Panicle, 8 to 15 cm. long, contracted, pale, purple-tinged.

Spikelets: 4 mm. long.

Glumes: Villous, hirsute on the nerves, the second broader than the first, 3-nerved.

Lemmas: Smooth and shining, the awn of the second hook-like.

Distribution: Open ground, meadows, and moist places, Maine to Kansas and Colorado, south to Georgia; common on the Pacific coast, British Columbia to California.

Distribution in British Columbia: Victoria, Gordon River, and Snake Island.
Remarks: Introduced from Europe; sometimes cultivated as a meadow grass on light soil.

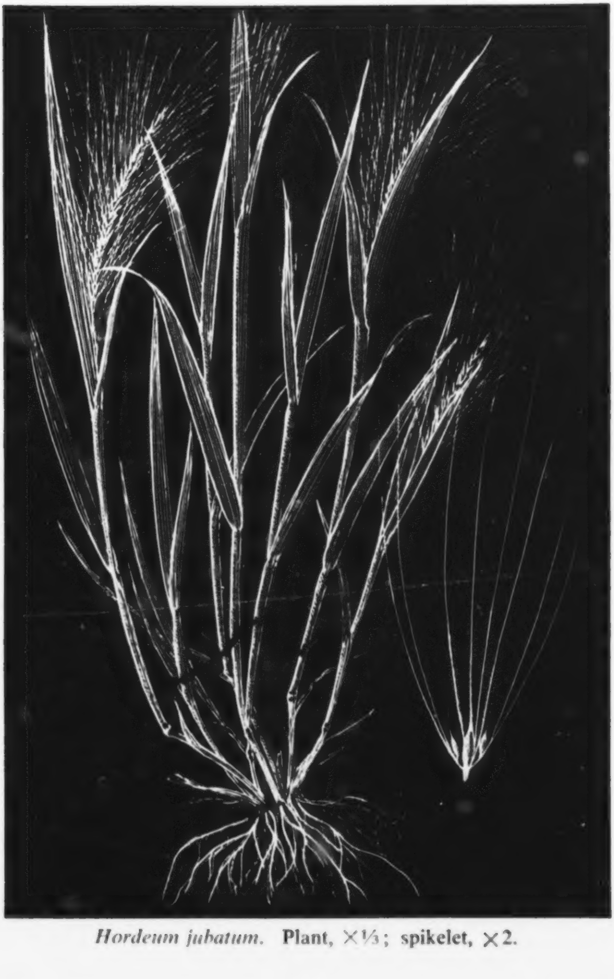
2. *Holcus mollis* L. Creeping Velvet Grass

Habit: Perennial.
Culms: Glabrous, 50 to 100 cm. tall, with vigorous slender rhizomes.
Sheaths: Except the lower glabrous.
Blades: Villous or velvety, 4 to 10 mm. wide.
Inflorescence: A panicle, ovate or oblong, rather loose, 6 to 10 cm. long.
Spikelets: 4 to 5 mm. long.
Glumes: Glabrous; awn of the second floret geniculate, exserted, about 3 mm. long.
Distribution: Damp places, British Columbia to California.
Distribution in British Columbia: Langley Prairie.
Remarks: Introduced from Europe and apparently spreading.

33. *Hordeum* L. Barley

Annual or perennial low or rather tall grasses, with flat blades and dense bristly spikes, disarticulating at the base of the rachis segment, this remaining as a stipe below the attached triad of spikelets. Spikelets 1-flowered (rarely 2-flowered), 3 (sometimes 2) together at each node of the articulate rachis (continuous in *Hordeum vulgare*), the back of the lemma turned from the rachis, the middle spikelet sessile, the lateral ones pediceled (except in *H. vulgare*); rachilla disarticulating above the glumes and, in the central spikelet, prolonged behind the palea as a bristle and sometimes bearing a rudimentary floret; lateral spikelets usually imperfect, sometimes reduced to bristles; glumes narrow, often subulate and awned, standing in front of the spikelet; lemmas rounded on the back, 5-nerved, usually obscurely so, tapering into a long awn.

Aside from the well-known cultivated barley *H. vulgare,* the species are of relatively minor value. All furnish forage when young, but many species are aggressive weeds and some (especially *H. jubatum*) at maturity are injurious to stock because of the sharp-pointed joints of the mature spikes, which pierce the nose and mouth parts. The auricle at the base of the blades, characteristic of *Hordeæ,* is wanting in some species of this genus.



Hordeum jubatum. Plant, ×⅓; spikelet, ×2.

KEY TO THE SPECIES OF HORDEUM

Plants perennial.
  Spike, including awns, as broad as long or nearly so, awns 2 to 5 cm. long .... 1. *H. jubatum*
  Spike, including awns, much longer than broad, awns not more than 1 cm. long .... 2. *H. brachyantherum*
Plants annual.
  Blades with prominent auricles at base.
    Rachis continuous, the 3 spikelets sessile .... 3. *H. vulgare*
    Rachis disarticulating, lateral spikelets pedicellate .... 4. *H. leporinum*
  Blades without auricles .... 5. *H. hystrix*

1. *Hordeum jubatum* L. Foxtail Barley

Habit: Tufted perennial.
Culms: Erect, decumbent at base, 30 to 60 cm. tall.
Sheaths: Smooth or the lower sometimes pubescent.
Blades: 2 to 5 mm. wide, scabrous.
Inflorescence: A nodding spike, 5 to 10 cm. long, about as wide, soft, pale.
Spikelets: Lateral spikelets reduced to 1 to 3 spreading awns.
Glumes: Glumes of perfect spikelet awn-like, 2.5 to 6 mm. long, spreading.
Lemmas: 6 to 8 mm. long with an awn as long as the glume.
Distribution: Open ground, meadows, and waste places, over most of the United States and Canada.
Distribution in British Columbia: Victoria and the Interior.
Remarks: A troublesome weed, especially in irrigated pastures. *H. jubatum* var. *cæspitosum* (Scrib.) Hitchc., bobtail barley. Awns 1.5 to 3 cm. long. Not common.

2. *Hordeum brachyantherum* Nevski. Meadow Barley

Hordeum boreale Scribn. & Smith.
Habit: Perennial.
Culms: Erect or ascending, 20 to 70 cm., sometimes to 100 cm. tall.
Sheaths: Lower sheath thin, often shredded, softly retrorse-pubescent to glabrous.
Blades: 3 to 8 mm., mostly 3 to 6 mm. wide.
Inflorescence: An erect spike, 8 to 10 cm. long, sometimes purplish.
Spikelets: Usually 7 to 10 mm. long, typically 1.5 mm. wide, the awn about 1 cm. long, the glume slightly shorter.
Glumes: Those of the lateral spikelets usually unequal, somewhat shorter.
Distribution: Meadows, bottom-lands, salt-marshes, grassy slopes up to 6,500 feet, Alaska to California; Newfoundland, Montana to New Mexico and Arizona.
Distribution in British Columbia: Vancouver Island, Point Grey, and Smithers.

3. ***Hordeum vulgare* L. Barley**

Habit: Annual.

Culms: Erect, 60 to 160 cm. tall.

Sheaths: Smooth.

Blades: Flat, mostly 5 to 15 mm. wide.

Inflorescence: An erect spike, 2 to 10 cm. long, excluding awns.

Spikelets: The 3 spikelets sessile.

Glumes: Divergent at base, narrow, nerveless, gradually passing into a stout awn.

Lemmas: Awn of lemma straight, erect, mostly 10 to 15 cm. long.

Distribution: All over North America where coarse grains are grown.

Remarks: Cultivated for the grain, sometimes spontaneous in fields and waste places, but not persistent. There are two groups of cultivated barleys. In the 2-rowed forms the lateral spikelets are fairly well developed but sterile. In the second group all the spikelets produce large seed. These are called 6-rowed or, if the lateral florets overlap, 4-rowed barleys.

4. ***Hordeum leporinum* Lind.**

Hordeum murinum L.

Habit: Annual.

Culms: Glabrous, rather stout, 30 to 50 cm. high.

Sheaths: Glabrous.

Blades: Pilose to glabrous; auricle at base of blade well developed.

Inflorescence: A spike 5 to 9 cm. long, often partly enclosed by the inflated uppermost sheath, the rachis internodes mostly 3 mm. long.

Spikelets: 1-flowered.

Glumes: Both glumes of the middle spikelet and the inner of the two lateral fusiform and strongly ciliate-margined, the others setaceous, all including awns, 1.5 to 3 cm. long.

Lemmas: Broad, their awns longer than the glumes.

Distribution: Waste places and open ground, British Columbia to California, east to Utah and Texas.

Distribution in British Columbia: Victoria.

Remarks: Introduced from southern Europe.

5. ***Hordeum hystrix* Roth. Mediterranean Barley**

Hordeum gussonianum Parl.

Habit: Annual.

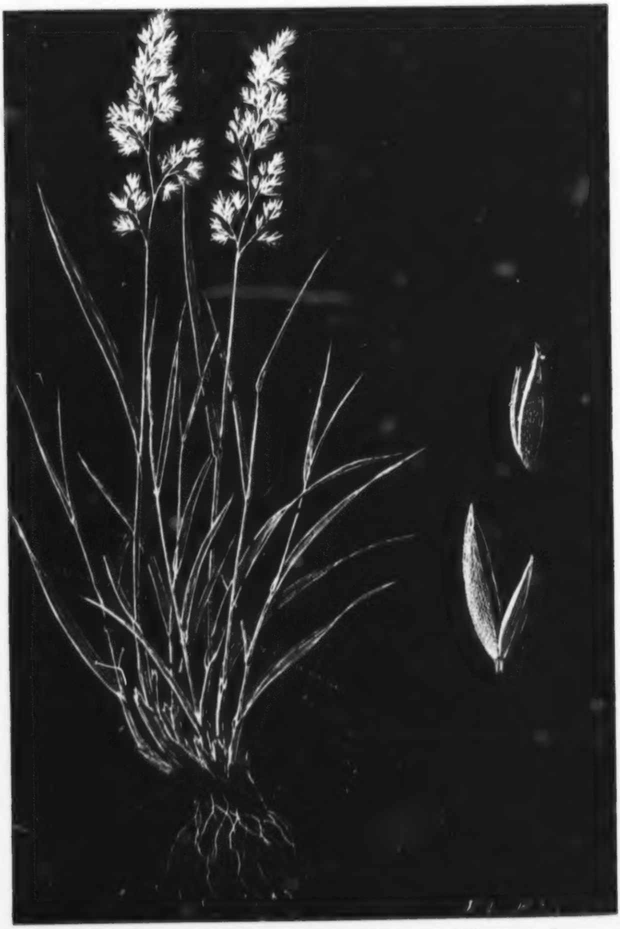
Culms: Spreading, geniculate, 10 to 40 cm. high.

Sheaths: Pubescent.

Blades: Short, 2 to 3 mm. wide, mostly flat, scabrous.

Inflorescence: An erect spike 1.5 to 3 cm. long, 10 to 15 mm. wide, the axis usually not readily breaking.

Glumes: Setaceous, rigid, nearly glabrous to scabrous, about 12 mm. long.



Koeleria cristata. Plant, ×⅓; glumes and floret, ×5.

Lemmas: Lemma of central spikelet 5 mm. long, the awn somewhat longer than the glume; floret of lateral spikelets reduced, short-awned.

Distribution: Fields and waste places, British Columbia to California, east to Utah.

Distribution in British Columbia: Victoria.

Remarks: Introduced from Europe.

34. *Koeleria* Pers.

Slender, low or rather tall annuals or perennials, with narrow blades and shining spike-like panicles. Spikelets 2- to 4-flowered, compressed, the rachilla disarticulating above the glumes and between the florets, prolonged beyond the perfect florets as a slender bristle or bearing a reduced floret at the tip; glumes usually about equal in length, unlike in shape, the first narrow, sometimes shorter, 1-nerved, the second wider than the first, broadened above the middle, 3- to 5-nerved; lemmas somewhat scarious, shining, the lowermost a little longer than the glume, obscurely 5-nerved, acute or short-awned, the awn, if present, borne just below the apex.

Koeleria cristata is a good forage grass and is a constituent of much of the native pasture throughout the Great Plains.

Koeleria cristata (L.) Pers. Koeleria or Junegrass

Habit: Tufted perennial.

Culms: Erect, puberulent below the panicle, 30 to 60 cm. tall.

Sheaths: At least the lower pubescent.

Blades: Flat or involute, glabrous or, especially the lower, pubescent, 1 to 3 mm. wide.

Inflorescence: Erect spike-like panicle, dense (loose in anthesis), often lobed, interrupted, or sometimes branched below, 4 to 15 cm. long, tapering at the summit.

Spikelets: Mostly 4 to 5 mm. long.

Glumes: Glumes and lemmas scaberulous, 3 to 4 mm. long, sometimes short-awned, the rachilla joints very short.

Distribution: Prairie, open woods, and sandy soil, Ontario to British Columbia, south to Louisiana and California.

Distribution in British Columbia: Dry interior, also Vancouver Island.

35. *Leersia* Swartz

Perennials, usually with creeping rhizomes, flat, scabrous blades, and mostly open panicles. Spikelets 1-flowered, strongly compressed laterally, disarticulating from the pedicel; glumes wanting; lemma chartaceous, broad, oblong to oval, boat-shaped, usually 5-nerved, the lateral pair of nerves close to the margins, these and the keel often hispid-ciliate, the intermediate nerves sometimes faint; palea as long as the lemma, much narrower, usually 3-nerved, the keel usually hispid-ciliate, the lateral nerves close to the margins, the margins firmly held by the margins of the lemma; stamens 6 or fewer.

Leersia oryzoides (L.) Swartz. Rice Cutgrass

Habit: Perennial.
Culms: Slender, weak, often decumbent at base, 1 to 1.5 m. tall, with slender creeping rhizomes.
Sheaths: Very scabrous.
Blades: Strongly retrorsely scabrous, the blades mostly 8 to 10 mm. wide.
Inflorescence: A terminal panicle, 10 to 20 cm. long, the flexuous branches finely spreading.
Spikelets: 4 to 5 mm. long, narrowly elliptic.
Lemmas: Lemma bristly-ciliate on the keel.
Distribution: Marshes, river-banks, and wet places, British Columbia to Maine, south to Florida and California.
Distribution in British Columbia: Sumas, Rosedale, and Kamloops.

36. *Lolium* L. Ryegrass

Annuals or perennials, with flat blades and slender, usually flat spikes. Spikelets several-flowered, solitary, placed edgewise to the continuous rachis, one edge fitting to the alternate concavities, the rachilla disarticulating above the glumes and between the florets; first glume wanting (except on the terminal spikelet and rarely in 1 or 2 spikelets in a spike), the second outward, strongly 3- to 5-nerved, equalling or exceeding the second floret; lemmas rounded on the back, 5- to 7-nerved, obtuse, acute, or awned.

L. perenne, perennial or English ryegrass, was the first meadow grass to be cultivated in Europe as a distinct, segregated species, the meadows and pastures formerly being native species.

L. temulentum, darnel, is occasionally found as a weed in grain-fields and waste places. It is in bad repute because of the presence in the grain of a narcotic poison, said to be due to a fungus. Darnel is supposed to be the plant referred to as the tares sown by the enemy in the parable of Scripture.

KEY TO THE SPECIES OF LOLIUM

Coarse annual, lemmas becoming greatly distended by the grain .... 1. *L. temulentum*
Perennials, lemmas not greatly distended.
  Awn well developed, often longer than the body of the lemma; blades 4 to 12 mm. wide .... 2. *L. multiflorum*
  Awn short or wanting; blades under 4 mm. wide .... 3. *L. perenne*

1. *Lolium temulentum* L. Darnel

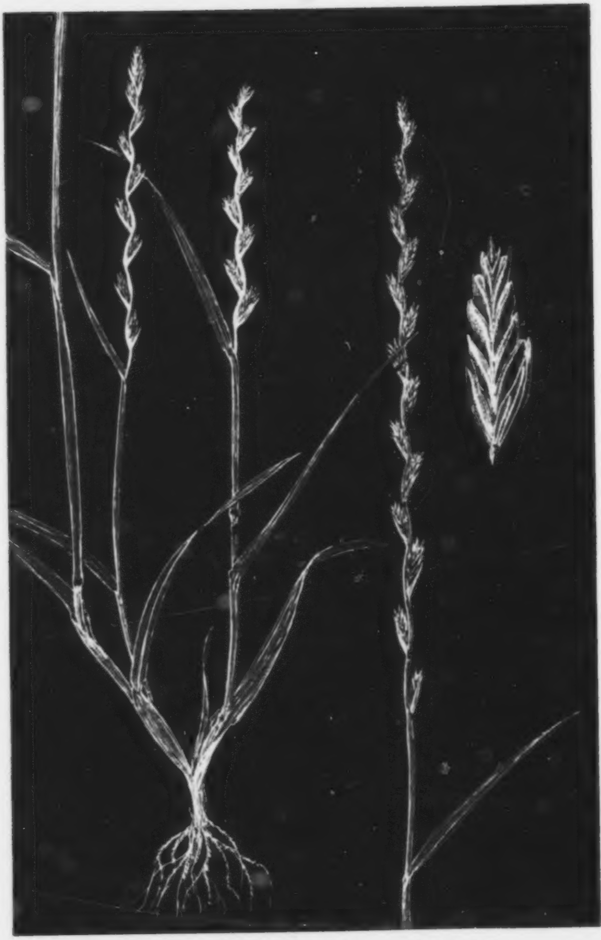
Habit: Annual.
Culms: 60 to 90 cm. tall.
Sheaths: Glabrous.
Blades: Mostly 3 to 6 mm. wide.
Inflorescence: A strict spike, 15 to 25 cm. long.
Spikelets: 5- to 7-flowered, 10 to 18 mm. long.
Glumes: About 2.5 cm. long, as long as or longer than the spikelet, firm, pointed.
Lemmas: Narrowly obovate, becoming distended by the large grain, the awn about equalling or longer than the body.
Distribution: Grain-fields and waste places, occasionally throughout eastern North America and rather common on the Pacific Coast.
Distribution in British Columbia: Duncan and Victoria.
Remarks: Introduced from Europe.

2. *Lolium multiflorum* Lam. Italian Ryegrass

Habit: Perennial.
Culms: 50 to 100 cm. high, stout.
Sheaths: Smooth or scabrous.
Blades: Scabrous at least above, 4 to 12 mm. wide.
Inflorescence: A spike, 10 to 25 cm. long, rarely branched below.
Spikelets: Often remote, 6- to 12-flowered, 10 to 18 mm. long.
Glumes: 8 to 12 mm. long; awns well developed, often longer than the body of the lemma.
Lemmas: 7 to 8 mm. long, at least the upper awn.
Auricles: Prominent at the summit of the sheaths.
Distribution: Meadows and waste places, British Columbia to Newfoundland, south to Virginia, and especially common on the Pacific Coast.
Distribution in British Columbia: Vancouver Island and Vancouver.

3. *Lolium perenne* L. Perennial Ryegrass

Habit: Short-lived perennial.
Culms: Erect or decumbent at the commonly reddish base, 30 to 60 cm. tall.



Lolium perenne. Plant, ×⅓; spikelet, ×2.

Sheaths: Glabrous.
Blades: Foliage glossy, the blades 2 to 4 mm. wide.
Inflorescence: A spike, often subfalcate, mostly 15 to 25 cm. long.
Spikelets: Mostly 6- to 10-flowered.
Glumes: 6 to 10 mm. long.
Lemmas: 5 to 7 mm. long, awnless or nearly so.
Distribution: Meadows and waste places, British Columbia to Newfoundland, south to Virginia and California.
Distribution in British Columbia: Vancouver Island.
Remarks: Introduced from Europe.

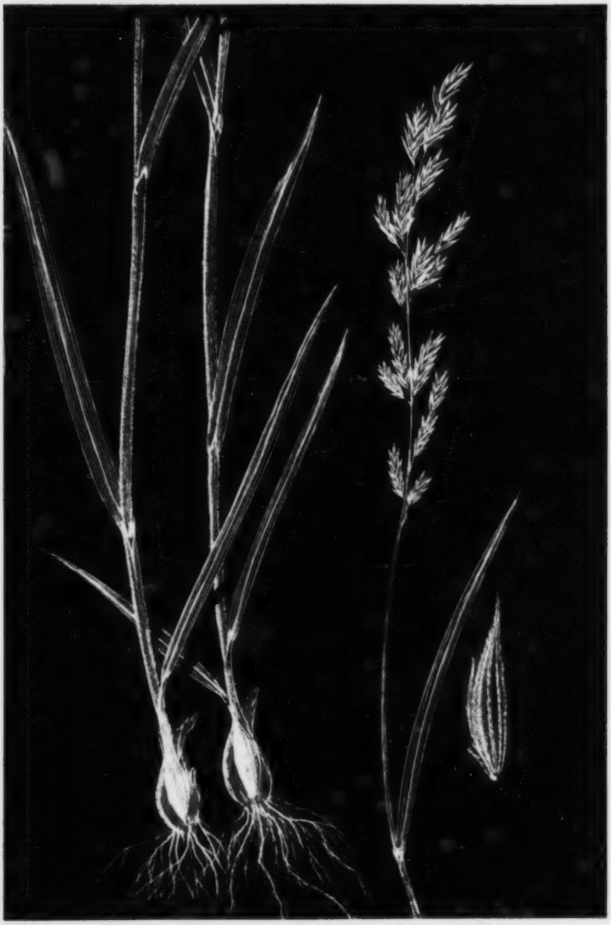
37. *Melica* L. Meliegrass

Rather tall perennials, the base of the culm often swollen into a corm, with closed sheaths, usually flat blades, narrow or sometimes open, usually simple panicles of relatively large spikelets. Spikelets 2- to several-flowered (rarely with 1 perfect floret), the rachilla disarticulating above the glumes and between the fertile florets (in some species spikelets falling entire), prolonged beyond the perfect florets and bearing 2 or 3 approximate gradually smaller empty lemmas, each enclosing the one above; glumes somewhat unequal, thin, often papery, scarious-margined, obtuse or acute, sometimes nearly as long as the lower floret, 3- to 5-nerved, the nerves usually prominent; lemmas convex, several-nerved, membranaceous or rather firm, scarious-margined, sometimes conspicuously so, awnless or sometimes awned from between the teeth of the bifid apex, the callus not bearded.

The species are in general palatable grasses but, not being gregarious, do not furnish much forage.

KEY TO THE SPECIES OF MELICA

Spikelets narrow.
  Lemmas long-awned from a bifid apex.
    Branches of panicle few, distant, spreading, naked on the lower half .... 1. *M. smithii*
    Branches of panicle short, appressed, spikelet-bearing from near the base .... 2. *M. aristata*
  Lemmas awnless or minutely awned.
    Culms not bulbous at base; lemmas obtuse, mucronate or awn-tipped .... 3. *M. harfordii*



Melica subulata. Plant, ×⅓; floret, ×2½.

Culms bulbous at base; lemmas acute or acuminate.
  Lemmas acuminate usually pilose; panicle narrow, the branches short, usually appressed .... 4. *M. subulata*
  Lemmas acute; panicle broad, the branches long and spreading .... 5. *M. geyeri*
Spikelets broad, awnless.
  Pedicles capillary, flexuous or recurved; panicle narrow .... 6. *M. spectabilis*
  Pedicles stouter, appressed .... 7. *M. bulbosa*

1. *Melica smithii* (Porter) Vasey. Smith Melic

Avena smithii Porter.
Habit: Perennial.
Culms: Slender, 60 to 120 cm. tall.
Sheaths: Retrorsely scabrous.
Blades: Lax, scabrous, 10 to 20 cm. long, 6 to 12 mm. wide.
Inflorescence: A panicle, 12 to 25 cm. long, the branches solitary, distant, spreading, naked below, sometimes reflexed, as much as 10 cm. long.
Spikelets: 3- to 6-flowered, 18 to 20 mm. long, sometimes purplish.
Glumes: Acute.
Lemmas: About 10 mm. long, with an awn 3 to 5 mm. long.
Distribution: Moist woodlands, British Columbia to Ontario, south to Wyoming and Oregon.
Distribution in British Columbia: Alberni, Bridal Veil Falls, and Nelson.

2. *Melica aristata* Thurb. ex Boland

Habit: Perennial.
Culms: Erect or decumbent below, 60 to 100 cm. tall.
Sheaths: Scabrous to pubescent.
Blades: 3 to 5 mm. wide, more or less pubescent.
Inflorescence: A narrow panicle, 10 to 15 cm. long, the branches short, mostly appressed or ascending.
Spikelets: About 15 mm. long excluding awns.
Glumes: 10 to 12 mm. long.
Lemmas: 7-nerved, scabrous, awned, the awn 6 to 10 mm. long.
Distribution: Dry woods, meadows, and open slopes, British Columbia and Montana and south to California.
Distribution in British Columbia: Collected only from Field.

3. *Melica harfordii* Boland. Harford Melic

Habit: Tufted perennial.
Culms: 60 to 120 cm. tall, often decumbent below.
Sheaths: Scabrous to villous.
Blades: Scabrous, firm, flat to subinvolute, 1 to 4 mm. wide.
Inflorescence: A narrow panicle, 10 to 15 cm. long, the branches appressed.

Spikelets: 1 to 1.5 cm. long, short-pediceled.
Glumes: 7 to 9 mm. long, obtuse.
Lemmas: Rather faintly 7-nerved, hispidulous below, pilose on the lower part of the margin, the apex emarginate, mucronate, or with an awn less than 2 mm. long.
Distribution: Open dry woods and slopes, British Columbia south to California.
Distribution in British Columbia: Alberni and Cameron Lake.

4. *Melica subulata* (Griseb.) Scribn. Alaska Oniongrass

Habit: Perennial.
Culms: 60 to 125 cm. tall, mostly bulbous at base.
Sheaths: Retrorsely scabrous, often pillose.
Blades: Thin, usually 2 to 5 mm. wide, sometimes wider.
Inflorescence: A narrow panicle, mostly 10 to 20 cm. long, the branches appressed or spreading.
Spikelets: Narrow, 1.5 to 2 cm. long, loosely flowered.
Glumes: Narrow, obscurely nerved, the second about 8 mm. long.
Lemmas: Prominently 7-nerved, tapering to an acuminate point, awnless, the nerves more or less pilose-ciliate.
Distribution: Meadows, banks, and shady slopes, Alaska to California and east to Wyoming.
Distribution in British Columbia: Vancouver Island and the Interior.

5. *Melica geyeri* Munro. Geyer Oniongrass

Habit: Perennial with stout rootstocks.
Culms: 1 to 1.5 m. tall, bulbous at base.
Sheaths: Usually glabrous, sometimes slightly scabrous or pubescent.
Blades: Scabrous, mostly less than 5 mm. wide.
Inflorescence: A panicle, 10 to 20 cm. long, open, the branches slender, rather distant, spreading bearing a few spikelets above the middle.
Spikelets: 12 to 20 mm. long.
Glumes: Broad, smooth, papery, the second about 6 mm. long.
Lemmas: 7-nerved, scaberulous or nearly glabrous, narrowed to an obtuse point, awnless.
Distribution: Open dry woods and rocky slopes, at medium altitudes, British Columbia to California.
Distribution in British Columbia: Collected only from Alberni.

6. *Melica spectabilis* Scribn. Purple Oniongrass

Habit: Perennial.
Culms: 30 to 100 cm. tall, bulbous at base, rarely with a short rhizome.
Sheaths: Pubescent.
Blades: Flat to subinvolute, 2 to 4 mm. wide.

Inflorescence: A panicle, mostly 10 to 15 cm. long, narrow, the branches appressed.

Spikelets: Purple-tinged, rather turgid, 10 to 15 mm. long, the pedicles capillary, flexuous.

Glumes: Broad, papery.

Lemmas: Strongly 7-nerved, obtuse, scarious-margined, imbricate.

Distribution: Rocky or open woods or thickets, British Columbia to Montana, south to Colorado and northern California.

Distribution in British Columbia: Rare. Only record is from the Okanagan.

7. *Melica bulbosa* Geyer ex Port & Coult. Oniongrass

Melica bella Piper.

Habit: Perennial.

Culms: 30 to 60 cm. tall, bulbous at base.

Sheaths: Smooth or scabrous.

Blades: Flat to involute, 2 to 4 mm. wide, glabrous, scabrous, or pubescent.

Inflorescence: A narrow panicle, rather densely flowered, the branches short, appressed, rather stiff, mostly imbricate.

Spikelets: Papery with age, mostly 7 to 15 mm. long, the short pedicles erect.

Glumes: Broad and scarious, the first 5 to 6 mm. long, the second 7 to 8 mm.

Lemmas: Obscurely nerved, obtuse or slightly emarginate.

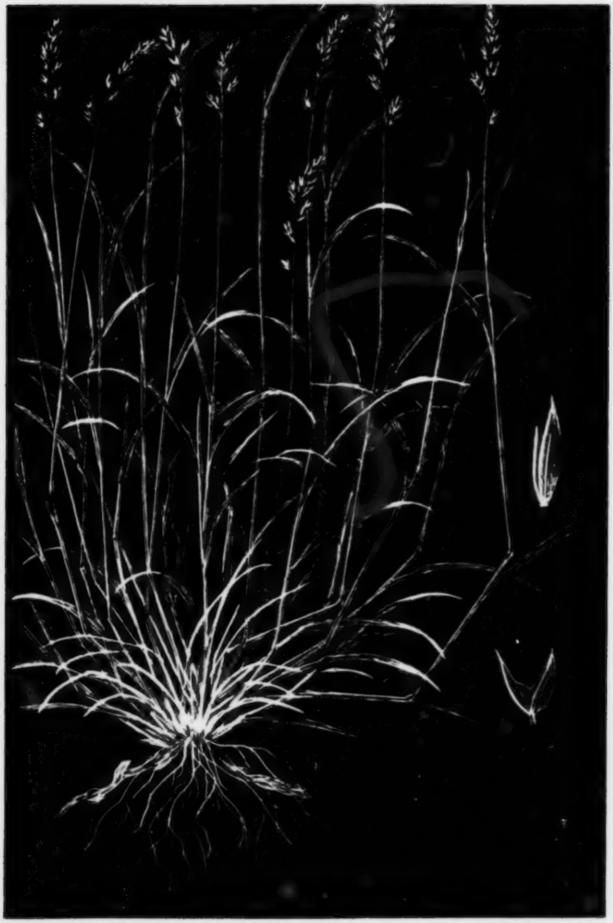
Distribution: Rocky woods and hills, British Columbia to Montana and south to California.

Distribution in British Columbia: Merritt, Okanagan, and Kokanee on Kootenay Lake

38. *Muhlenbergia* Schreb. Muhly

Perennial, low or moderately tall or rarely robust grasses, rhizomatous, the culms simple or much branched, the inflorescence a narrow (sometimes spike-like) or open panicle. Spikelets 1-flowered (occasionally 2-flowered), the rachilla disarticulating above the glumes; glumes usually shorter than the lemma, sometimes as long, obtuse to acuminate or awned, keeled or convex on the back, the first sometimes small, rarely obsolete; lemma firm-membranaceous, 3-nerved (the nerves sometimes obscure or rarely an obscure additional pair), with a very short callus, rarely long-pilose, usually minutely pilose, the apex acute, awned from the tip or just below it, or from between very short lobes, sometimes only mucronate, the awn straight or flexuous.

Many of the western species are important range grasses, forming a considerable proportion of the grass flora of the arid and semi-arid regions, and long ago dubbed "muhly" by forest rangers.



Muhlenbergia richardsonis. Plant, × ½; glumes and lemma, × 10.

KEY TO THE SPECIES OF MUHLENBERGIA

Blades 2 mm. wide or less, mostly short and involute.
Panicles open, the spikelets on slender panicles .... 1. *M. asperifolia*
Panicles narrow, more or less condensed, the spikelets on short pedicles .... 2. *M. richardsonis*
Blades flat, at least some of them more than 3 mm., usually 5 mm. wide or more.
Glumes with stiff scabrous awn-tips, much exceeding the awnless lemma.
Culms mostly simple or branching at base; internodes minutely puberulent; sheaths not or scarcely keeled .... 3. *M. glomerata*
Culms subcompressed, mostly branching from the middle nodes; internodes smooth and glossy except at summit; sheaths keeled .... 4. *M. racemosa*
Glumes accuminate, sometimes awn-tipped, but not stiff and exceeding the lemma .... 5. *M. sylvatica*

1. ***Muhlenbergia asperifolia*** **(Ness. & Mey.) Parodt. Scratchgrass**

Sporobolus asperifolius Ness. & Mey.
Habit: Perennial, pale or glaucous, with slender rhizomes.
Culms: Branching at base, spreading, slender, compressed, 10 to 50 cm. tall, the branches ascending or erect.
Sheaths: Somewhat compressed-keeled, usually overlapping.
Blades: Flat, crowded, scabrous, mostly 2 to 5 cm. long, 1 to 2 mm. wide.
Inflorescence: A diffuse panicle, 5 to 15 cm. long, about as wide, the capillary scabrous branches finely widely spreading, the panicle at maturity breaking away.
Spikelets: 1.5 to 2 mm. long, usually 2-flowered, the pedicels capillary.
Glumes: Acute, from half to nearly as long as the spikelet.
Lemmas: Thin, broad, minutely mucronate from an obtuse apex.
Ligule: Minute, erose-toothed.
Distribution: Damp or marshy often alkaline soils, along irrigation-ditches and banks of streams, Alberta to British Columbia and over most of the central and western States.
Distribution in British Columbia: Athalmer, Tranquille, and Vaseaux Lake.

2. ***Muhlenbergia richardsonis*** **(Trin.) Rydb. Mat Muhly**

Habit: Perennial from numerous hard creeping rhizomes.
Culms: Wiry, nodulose-roughened, erect or decumbent at base, from 5 to 60 cm. tall.
Blades: Usually involute, 1 to 5 cm. long, rarely longer.
Inflorescence: A panicle, narrow, interrupted, or sometimes rather close and spike-like, 2 to 10 cm. long.
Spikelets: 2 to 3 mm. long.
Glumes: About half as long as the spikelets, ovate.

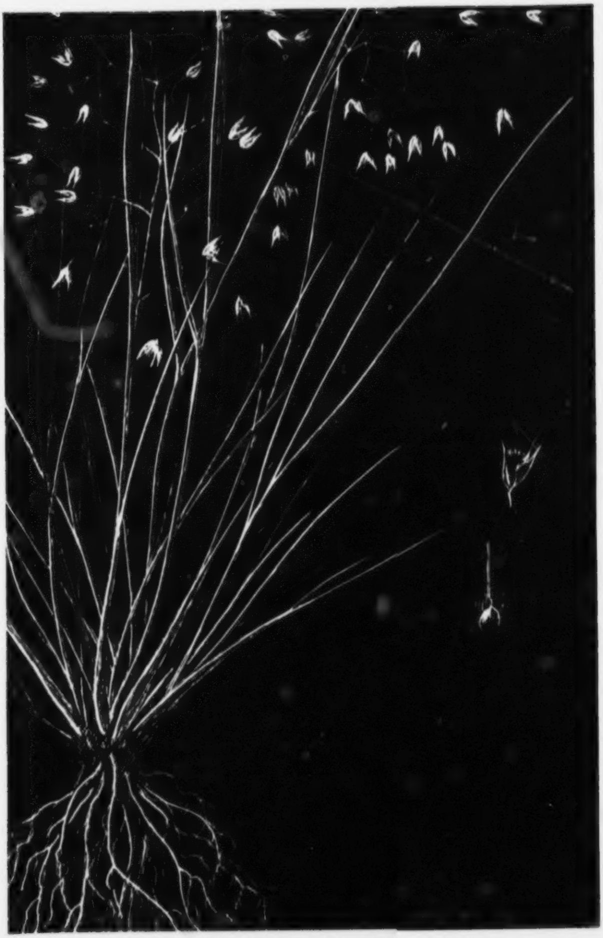
Lemma: Lanceolate, acute, mucronate.
Ligule: 2 to 3 mm. long.
Distribution: Dry or moist open often alkaline soil, New Brunswick to Alberta, south to Nebraska and California.
Distribution in British Columbia: Cariboo and the Chilcotin.
Remarks: According to Hitchcock, there are two intergrading forms of this species: one with rather stout decumbent or somewhat spreading culms (*M. squarrosa* (Trin.) Rydb.), the other with slender erect culms (*M. richardsonis* (Trin.) Rydb.).

3. ***Muhlenbergia glomerata*** **(Willd.) Trin.**

Habit: Perennial with creeping rhizomes.
Culms: Slender, erect or suberect, 30 to 90 cm. tall, simple or with a few erect branches at the base, the internodes minutely puberulent.
Sheaths: Rounded on the back.
Blades: Flat, 5 to 15 cm. long, lax, 2 to 5 mm. wide, ascending.
Inflorescence: A narrow panicle, compact, lobed, mostly interrupted at the base, often purplish, 3 to 10 cm. long.
Spikelets: 5 to 6 mm. long, the narrow, attenuate, subequal glumes stiffly awn-tipped.
Lemmas: About 3 mm. long, pointed, pilose on the lower part.
Ligule: Minute.
Distribution: Bogs, swamps, and moist ground, Newfoundland to British Columbia, Maine to Wisconsin, Virginia and Indiana.
Distribution in British Columbia: Kinbasket Lake, Fairmont Hotsprings, the Big Bend Highway.
Remarks: Has been confused with *M. racemosa;* occasionally difficult to distinguish. Internodes are sometimes glabrous, but are roughish to the finger-nail.

4. ***Muhlenbergia racemosa*** **(Michx.) B. S. P.**

Habit: Perennial from creeping branching scaly rhizomes, stout.
Culms: Erect or ascending, subcompressed, 30 to 100 cm. tall, usually finely branching from the middle nodes, the branches mostly erect, the internodes smooth and shining except toward the summit.
Sheaths: Loose, keeled.
Blades: Flat, 4 to 18 cm. long, 2 to 7 mm. wide, erect to ascending.
Inflorescence: A panicle 3 to 14 cm. long, narrow, compact, often lobed.
Spikelets: 5 to 7 mm. long.
Glumes: The narrow attenuate subequal glumes stiffly awn-tipped.
Lemmas: 2.5 to 3.5 mm. long, acuminate, rarely with a short awn, pilose on the lower part.
Ligules: 1 to 1.5 mm. long.
Distribution: Meadows, prairies, rocky slopes, dry ground and waste places, Manitoba to British Columbia; Michigan and Indiana to Washington.
Distribution in British Columbia: Not common. Collected only in the Cariboo.



Oryzopsis hymenoides. Plant, ×⅓; spikelet and floret, ×1.

5. *Muhlenbergia sylvatica* (Torr.) Torr.

Muhlenbergia umbrosa Scribn.

Habit: Perennial with creeping scaly rhizomes.

Culms: Slender, retrorsely scaberulous below the nodes, rather sparingly branching from the middle and upper nodes, finally leaning, the subfiliform branches often elongate, drooping, the plant 40 to 100 cm. tall.

Blades: Flat, lax, ascending to spreading, 0.5 to 18 cm., commonly 8 to 15 cm. long, 2 to 8 mm. wide.

Inflorescence: A slender panicle, nodding, the slender branches appressed, slightly overlapping.

Glumes: Lanceolate, acuminate or awn-tipped, 2 to 3 mm. long.

Lemmas: Slightly exceeding the glumes, pilose below, tapering into a slender awn 5 to 10 mm. long.

Distribution: Moist woods and thickets, Quebec and Maine to South Dakota, south to Alabama and Texas. Found around Griffin Lake, British Columbia; probably introduced.

Distribution in British Columbia: Roadsides at Griffin Lake.

39. *Oryzopsis* Michx. Ricegrass

Mostly slender perennials, with flat or often involute blades and terminal narrow or open panicles. Spikelets 1-flowered, disarticulating above the glumes; glumes about equal, obtuse to acuminate; lemma indurate, usually about as long as the glumes, broad, oval or oblong, nearly terete, usually pubescent, with a short, blunt, oblique callus, and a short deciduous, sometimes bent and twisted awn; palea enclosed by the edges of the lemma.

Nearly all the species are highly palatable to stock, but are usually not in sufficient abundance to be of importance, except *O. hymenoides* (Indian ricegrass), which is common in the arid and semi-arid regions of the West and furnishes much feed. The seed has been used for food by the Indians.

KEY TO THE SPECIES OF ORYZOPSIS

Lemma smooth .... 1. *O. micrantha*
Lemma pubescent.
  Pubescence on lemma long and silky .... 2. *O. hymenoides*
  Pubescence on lemma short, appressed.
    Spikelets, excluding awn, 6 to 9 mm. long; blades flat ... 3. *O. asperifolia*
    Spikelets, excluding awn, 5 mm. long or less; blades involute or subinvolute.
      Panicle branches erect or appressed .... 4. *O. exigua*
      Panicle branches loosely ascending or spreading .... 5. *O. pungens*

1. *Oryzopsis micrantha* (Trin. & Rupr.) Thurb.
Littleseed Ricegrass

Habit: Perennial.

Culms: Densely tufted, erect, slender, 30 to 70 cm. tall.

Blades: Scabrous, flat or involute, 0.5 to 2 mm. wide.

Inflorescence: An open panicle, 10 to 15 cm. long, the branches distant, single or in pairs, spreading or finely reflexed, 2 to 5 cm. long, with short-pediceled appressed spikelets toward the ends.

Glumes: Thin, acuminate, 3 to 4 mm. long.

Lemmas: Elliptic, glabrous, or rarely appressed-pilose, 2 to 2.5 mm. long, yellow or brown, the straight awn 5 to 10 mm. long.

Ligule: About 1 mm. long.

Distribution: Open dry woods and rocky slopes, British Columbia to North Dakota, south to Nevada and California.

Distribution in British Columbia: Pavilion Lake and the Cariboo.

2. *Oryzopsis hymenoides* (Roem. & Schult.) Ricker.
Indian Ricegrass

Habit: Perennial.

Culms: Densely tufted, 30 to 60 cm. tall.

Blades: Slender, involute, nearly as long as the culms.

Inflorescence: A defuse panicle, 7 to 15 cm. long, the slender branches in pairs, the branchlets dichotomous, all divaricately spreading, the ultimate pedicels capillary, flexuous.

Glumes: About 6 to 7 mm. long, puberulent to glabrous, papery, ovate, 3- to 5-nerved, abruptly pointed.

Lemmas: Fusiform, turgid, about 3 mm. long, nearly black at maturity, densely long-pilose with white hairs 3 mm. long; awn about 4 mm. long, straight, readily deciduous.

Ligule: About 6 mm. long, acute.

Distribution: Dry sandy areas and plains, British Columbia to Manitoba, south to Texas and California.

Distribution in British Columbia: Interior.

3. *Oryzopsis asperifolia* Michx.

Habit: Perennial.

Culms: Tufted, the innovations erect, the fertile culms widely spreading or prostrate, 20 to 70 cm. long, nearly naked.

Sheaths: The two or three sheaths bearing reduced or obsolete blades.

Blades: Basal blades erect, firm, scabrous, flat to somewhat revolute, elongate, 3 to 8 mm. wide, tapering toward each end, glaucous beneath.

Inflorescence: A nearly simple panicle, rather few-flowered, 5 to 8 cm. long, the branches appressed.

Spikelets: Spikelets on appressed pedicels 3 to 6 mm. long.

Glumes: 6 to 8 mm. long, somewhat obovate, about 7-nerved, abruptly pointed.

Lemmas: About as long as the glumes, sparingly pubescent, more densely so on the callus, pale or yellowish at maturity, the awn 5 to 10 mm. long.

Distribution: Wooded slopes and dry banks, Newfoundland to British Columbia, south to Maine and Utah.

Distribution in British Columbia: Armstrong, Kamloops, and Kootenay Lake. Common northwards.

4. *Oryzopsis exigua* Thurb. Little Ricegrass

Habit: Perennial.

Culms: Densely tufted, stiffly erect, scabrous, 15 to 30 cm. tall.

Sheaths: Smooth or somewhat scabrous.

Blades: Involute-filiform, stiffly erect, scabrous, 5 to 10 cm. long, the culm blades about 2, shorter.

Inflorescence: A narrow panicle, 3 to 6 cm. long, the branches appressed, the lower 1 to 2 cm. long.

Spikelets: Short-pediceled.

Glumes: Abruptly acute, 4 mm. long.

Lemmas: Appressed-pilose, about as long as the glumes, the awn about 5 mm. long, not twisted, geniculate.

Ligule: 2 to 3 mm. long.

Distribution: Dry open ground or open woods at moderate altitudes, British Columbia to Montana, south to Colorado and Oregon.

Distribution in British Columbia: Kingsvale and Merritt.

5. *Oryzopsis pungens* (Torr.) Hitchc.

Habit: Perennial.

Culms: Tufted, erect, slender, 20 to 50 cm. tall.

Blades: Elongate, slender, flat or involute, less than 2 mm. wide.

Inflorescence: A narrow panicle, 3 to 6 cm. long, the branches erect or ascending or spreading in anthesis.

Spikelets: Long-pediceled.

Glumes: 3 to 4 mm. long, obscurely 5-nerved, obtuse.

Lemmas: About as long as the glumes, rather densely pubescent, the awn usually 1 to 2 mm. long.

Distribution: Sandy or rocky soil, Labrador to British Columbia, south to Indiana, South Dakota, and Colorado.

Distribution in British Columbia: Frequently northward, Quesnel, Francois Lake, and Hazelton.

40. *Panicum* L. Panicum

Annuals or perennials of various habit. Spikelets more or less compressed dorsiventrally, in open or compact panicles, rarely racemes; glumes 2, herbaceous, nerved, usually very unequal, the first often minute, the second typically equalling the sterile lemma, the latter of the same texture and simulating a third glume, bearing in its axil a membranaceous or hyaline palea and sometimes a staminate flower, the palea rarely wanting; fertile lemma chartaceous-indurate, typically obtuse, the nerves obsolete, the margins inrolled over an enclosed palea of the same texture.

KEY TO THE SPECIES OF PANICUM

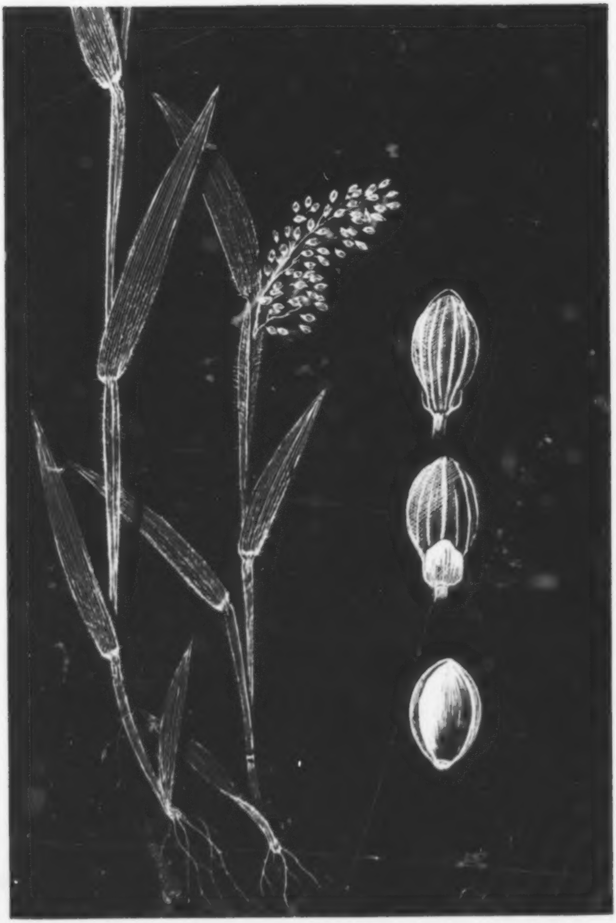
Basal leaves usually distinctly different from those of the culm, forming a winter rosette.
  Spikelets 3 mm. long; panicle branches few .... 1. *P. scribnerianum*
  Spikelets 2 mm. long or less; panicle branches many.
    Herbage velvety-pubescent .... 2. *P. thermale*
    Herbage not velvety.
      Blades strongly pubescent, the hairs of the lower surface scarcely appressed; glumes rather long-hairy .... 3. *P. pacificum*
      Blades less pubescent, the hairs of the lower surface appressed; glumes short-pubescent .... 4. *P. occidentale*
Basal leaves similar to the culm leaves, not forming a winter rosette, spikelets all fertile.
  Plants annual .... 5. *P. capillare*
  Plants perennial .... 6. *P. agrostoides*

1. *Panicum scribnerianum* Nash. Scribner's Panicum

Habit: Perennial.
Culms: 20 to 50 cm. tall, glabrous or harshly puberulent or sometimes ascending-pilose.
Sheaths: Striate, papillose-hispid to nearly glabrous.
Blades: Ascending or erect, 5 to 10 cm. long, 6 to 12 mm. wide, firm, rounded at the ciliate base, glabrous on the upper surface, appressed-pubescent beneath.
Inflorescence: A panicle 4 to 8 cm. long.
Spikelets: Broadly obovoid, about 3 mm. long.
Glumes: Sparsely pubescent, strongly nerved.
Distribution: Sandy soil or dry prairies, Maine to British Columbia and Washington, south to Virginia.
Distribution in British Columbia: Armstrong, Poplar Grove, and Penticton.

2. *Panicum thermale* Boland. Hot-springs Panicum

Habit: Perennial.
Culms: Densely tufted, 10 to 30 cm. tall, ascending or spreading, the nodes with a dense grain of short hairs.



Panicum scribnerianum. Plant, ×½; two views of spikelet, and floret, ×5.

Blades: Thick, 3 to 8 cm. long, 5 to 12 mm. wide.
Inflorescence: A panicle, 3 to 6 cm. long, the axis villose.
Spikelets: 1.9 to 2 mm. long, pilose.
Glumes: Strongly nerved, pubescent.
Distribution: Wet saline soil, mostly around hot springs. British Columbia to Alberta, south to Wyoming and California.
Distribution in British Columbia: Around the hot springs at Fairmont.

3. ***Panicum pacificum*** **Hitchc. & Chase. Pacific Panicum**

Habit: Perennial.
Culms: 25 to 50 cm. tall, ascending or spreading, leafy, pilose, the nodes short-bearded.
Sheaths: Pilose.
Blades: Erect or ascending, 5 to 10 cm. long, 5 to 8 mm. wide, the upper surface pilose, the lower surface appressed-pubescent.
Inflorescence: Panicle 5 to 10 cm. long.
Spikelets: 1.8 to 2 mm. long.
Glumes: Pubescent.
Ligule: 3 to 4 mm. long.
Distribution: Sandy shores and slopes, British Columbia and Montana to southern California.
Distribution in British Columbia: Shawnigan Lake, Agassiz, and Osoyoos.

4. ***Panicum occidentale*** **Scribn. Western Panicum**

Habit: Perennial.
Culms: Yellowish green, leafy toward base, 15 to 40 cm. tall, spreading, sparsely pubescent.
Sheaths: Sparsely pubescent.
Blades: Firm, erect or ascending, 4 to 8 cm. long, 5 to 7 mm. wide, the upper surface nearly glabrous, the under-surface appressed-pubescent.
Inflorescence: A panicle, 4 to 7 cm. long.
Spikelets: 1.8 mm. long.
Glumes: The hairs on the glumes very short.
Ligules: 3 to 4 mm. long.
Distribution: Peat bogs and moist sandy ground, British Columbia and Idaho to southern California.
Distribution in British Columbia: Vancouver Island, Gray Creek, and Destiny Bay.

5. ***Panicum capillare*** **L. Witch Grass**

Habit: Annual.
Culms: Erect or somewhat spreading at base, 20 to 80 cm. tall, papillose-hispid to nearly glabrous.
Sheaths: Hispid.
Blades: 10 to 25 cm. long, 5 to 15 mm. wide, hispid on both surfaces.

Inflorescence: Densely flowered panicles, very diffuse, often half the length of the entire plant, included at the base till maturity, the branches finely divaricately spreading, the whole panicle breaking away and rolling before the wind.

Spikelets: 2 to 2.5 mm. long.

Lemmas: Lance-ovate, acute.

Distribution: Open ground and waste places, a weed in cultivated ground.

Remarks: *P. capillare* var. *occidentale* Rydb. (*P. barbipulvinatum* Nash). This variety is the common form in British Columbia. It differs from the species in having blades shorter, less pubescent, crowded toward the base; panicle more exserted; spikelets somewhat longer (2.5 and 3.5 mm.).

6. *Panicum agrostoides* Spreng.

Habit: Perennial, in dense clumps from a short crown.

Culms: 50 to 100 cm. tall.

Blades: Erect, folded at base, flat above, 20 to 50 cm. long, 5 to 12 mm. wide.

Inflorescence: Panicles terminal and auxiliary, 10 to 30 cm. long, half to two-thirds as wide, sometimes more diffuse, the densely flowered branchlets mostly on the underside of the branches. The pedicels usually bearing at the summit 1 to several delicate hairs.

Spikelets: About 2 mm. long.

Distribution: Wet meadows and shores, Maine to Florida and Texas, Vancouver Island to California.

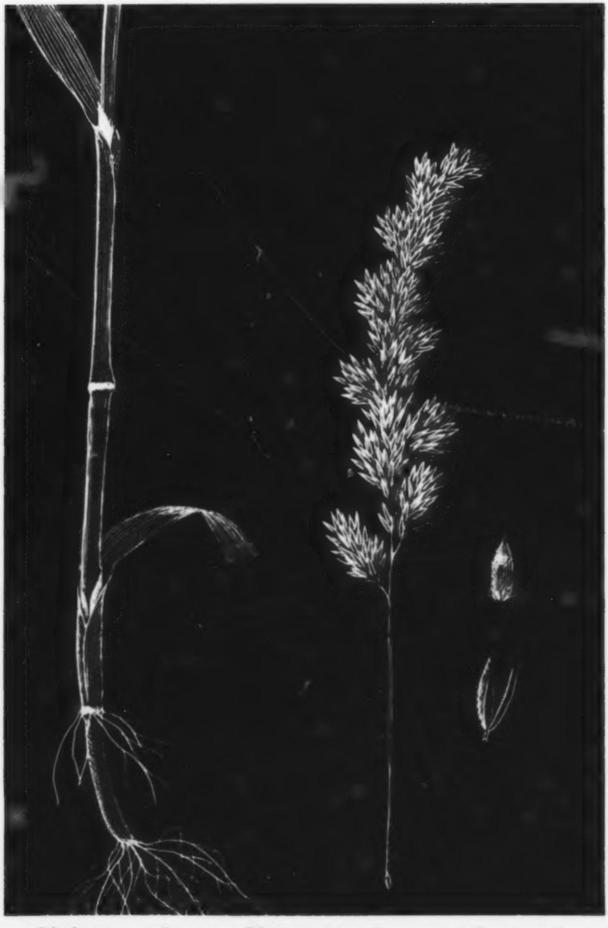
Distribution in British Columbia: Only record is Macoun's collection from Sproat Lake.

41. *Phalaris* L. Canary Grass

Annuals or perennials, with numerous flat blades and narrow or spike-like panicles. Spikelets laterally compressed, with 1 terminal perfect floret and 2 sterile lemmas below, the rachilla disarticulating above the glumes, the usually inconspicuous sterile lemmas falling closely appressed to the fertile floret; glumes equal, boat-shaped, often winged on the keel; sterile lemmas reduced to 2 small, usually minute, scales (rarely only 1); fertile lemma coriaceous, shorter than the glumes, enclosing the faintly 2-nerved palea.

KEY TO THE SPECIES OF PHALARIS

Plants annual; panicles 2 to 3 cm. long .... 1. *P. canariensis*
Plants perennial; panicles 6 to 20 cm. long .... 2. *P. arundinacea*



Phalaris arundinacea. Plant, ×⅓; glumes and floret, ×2.

1. ***Phalaris canariensis*** **L. Canary Grass**

Habit: Annual.

Culms: Erect, 30 to 60 cm. tall.

Blades: Short, 4 to 7 mm. wide.

Inflorescence: A panicle, ovate to oblong-ovate, dense, 1.5 to 3 cm.

Spikelets: Broad, imbricate, pale with green stripes.

Glumes: 7 to 8 mm. long, abruptly pointed, the green keel with a prominent pale wing, broadened upward.

Lemmas: Fertile lemma 5 to 6 mm. long, acute, densely appressed-pubescent; sterile lemmas at least half as long as fertile.

Distribution: Waste places, infrequent, British Columbia to Nova Scotia, south to Virginia and California.

Distribution in British Columbia: New Westminster, Victoria, and Williams Lake.

Remarks: Introduced from the western Mediterranean region. This species furnishes the canary seed of commerce.

2. ***Phalaris arundinacea*** **L. Reed Canary Grass**

Habit: Perennial.

Culms: Erect, 60 to 150 cm. tall, glaucous, with creeping rhizomes.

Blades: Slightly scabrous above, 7 to 12 mm. wide.

Inflorescence: A panicle, 7 to 18 cm. long, narrow, the branches spreading during anthesis, the lower as much as 5 cm. long.

Spikelets: 5 to 6 mm. long.

Glumes: About 5 mm. long, narrow, acute, the keel scabrous, very narrowly winged.

Lemmas: Fertile lemma lanceolate, 4 mm. long, with a few appressed hairs; sterile lemmas villose 1 mm. long.

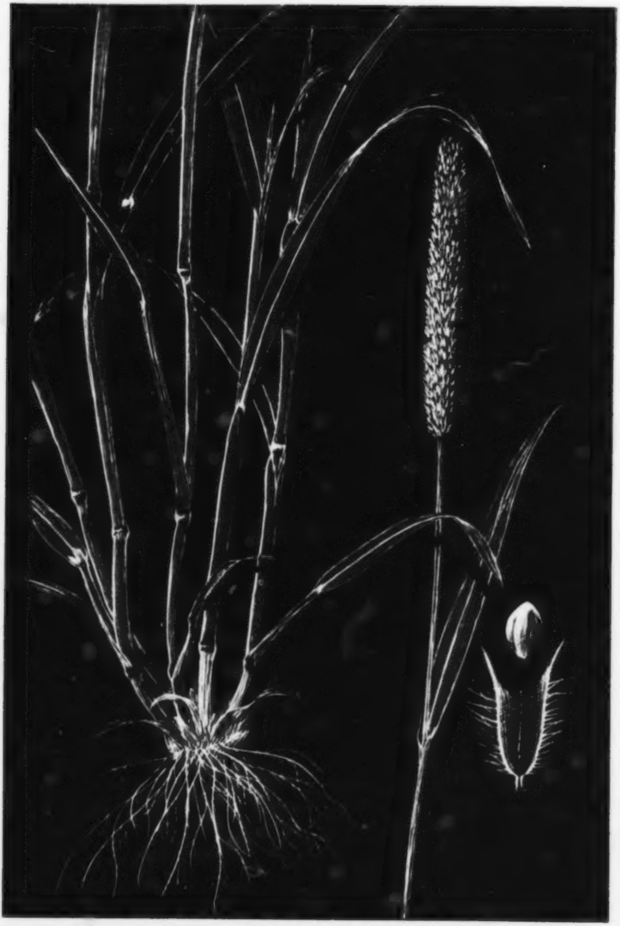
Distribution: Marshes, river-banks, and moist places, British Columbia to New Brunswick, south to North Carolina, New Mexico, and California.

Distribution in British Columbia: Vancouver Island, Chilcotin, and Vanderhoof.

Remarks: *P. arundinacea* var. *picta* L. Ribbon Grass. Blades striped with white. Introduced from Eurasia.

42. *Phleum* L. Timothy

Annuals or perennials, with erect culms, flat blades, and dense, cylindric panicles. Spikelets 1-flowered, laterally compressed, disarticulating above the glumes; glumes, equal, membranaceous, keeled, abruptly mucronate or awned or gradually acute; lemma shorter than the glumes, hyaline, broadly truncate, 3- to 5-nerved; palea narrow, nearly as long as the lemma.



Phleum pratense. Plant, ×⅓; glumes and floret, ×5.

The common species, *P. pratense,* or timothy, is our most important hay grass. The native species, *P. alpinum,* furnishes forage in mountain meadows.

KEY TO THE SPECIES OF PHLEUM

Panicle cylindric, several times longer than wide .... 1. *P. pratense*
Panicle ovoid or oblong, usually not more than twice as long as wide .... 2. *P. alpinum*

1. *Phleum pratense* L. Timothy

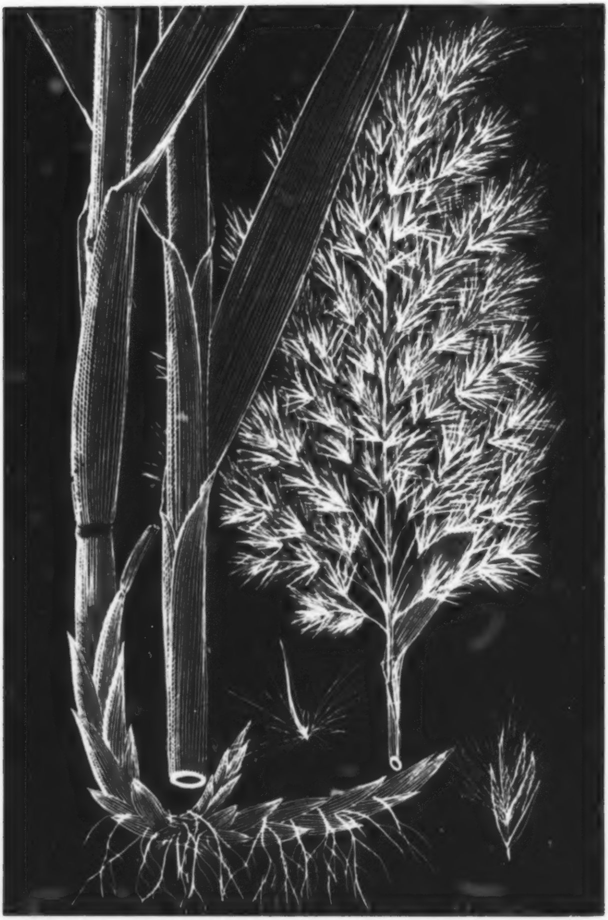
Habit: Perennial.
Culms: 50 to 100 cm. tall, from a swollen or bulb-like base, forming large clumps.
Sheaths: Glabrous.
Blades: Elongate, mostly 5 to 8 mm. wide.
Inflorescence: A cylindric panicle, commonly 5 to 10 cm. long.
Spikelets: The spikelets crowded, spreading.
Glumes: About 3.5 mm. long, truncate with a stout awn 1 mm. long, pectinate-ciliate on the keel.
Distribution: Commonly escaped from cultivation along roadsides and in fields and waste places throughout Canada and the United States.
Remarks: Introduced from Eurasia.

2. *Phleum alpinum* L. Mountain Timothy

Habit: Perennial.
Culms: 20 to 50 cm. tall, from a decumbent somewhat creeping, densely tufted base.
Sheaths: Glabrous.
Blades: Mostly less than 10 cm. long, 4 to 6 mm. wide.
Inflorescence: A panicle, ellipsoid or short cylindric, bristly.
Glumes: About 5 mm. long, hispid-ciliate on the keel, the awns 2 mm. long.
Distribution: Common in mountain meadows and wet places, British Columbia to Greenland, south to Maine, Washington, and California.
Distribution in British Columbia: Vancouver Island, Selkirk Range, Manning Park, and Yoho.

43. *Phragmites* Trin.

Very large perennial marsh grasses with broad leaves; spikelets large, several-flowered, the rachilla pubescent with long silky hairs; glumes unequal, the lower half as long as the upper; lowest flower staminate or neutral; lemmas narrow and long-acuminate, the upper successively shorter; palea much shorter than the lemmas.



Phragmites communis. Plant, × ¼; spikelet and floret, × 1½.

Phragmites communis Trin. Common Reed

Phragmites phragmites Karst.

Habit: Perennial with stout creeping rhizomes.

Culms: Erect, 2 to 4 m. tall, with rhizomes and sometimes with stolons.

Blades: Flat, 1 to 5 cm. wide.

Inflorescence: A tawny or purplish panicle, 15 to 40 cm. long, the branches ascending, rather densely flowered.

Spikelets: 12 to 15 mm. long, the florets exceeded by the hairs of the rachilla.

Glumes: 3-nerved, or the upper 5-nerved, lanceolate, acute, unequal, the first about half as long as the upper, the second shorter than the florets.

Lemmas: Narrow, long-acuminate, glabrous, 3-nerved, the florets successively smaller, the summits of all about equal; palea much shorter than the lemma.

Distribution: Marshes, banks of lakes and streams, and around springs, British Columbia to Nova Scotia, south to Louisiana and California.

Distribution in British Columbia: Vancouver Island, Okanagan Valley, and Vancouver.

Remarks: In the south-west the Mexicans use this grass for lattices in the construction of adobe huts. Sometimes used by the Indians for shafts of arrows.

44. *Pleuropogon* R. Br. Semaphore-grass

Soft annuals or perennials, with simple culms, flat blades, and loose racemes of rather large spikelets on a slender flexuous axis. Spikelets several- to many-flowered, linear, the rachilla disarticulating above the glumes and between the florets; glumes unequal, membranaceous or subhyaline, scarious at the somewhat lacerate tip, the first 1-nerved, the second obscurely 3-nerved; lemmas membranaceous, 7-nerved with a round indurate callus, the apex entire or 2-toothed, the midnerve extending into a short mucro or into an awn; keels of the palea winged on the lower half.

Palatable grasses, but too infrequent to be of economic value.

Pleuropogon refractus (A. Gray) Benth. Nodding Semaphore-grass

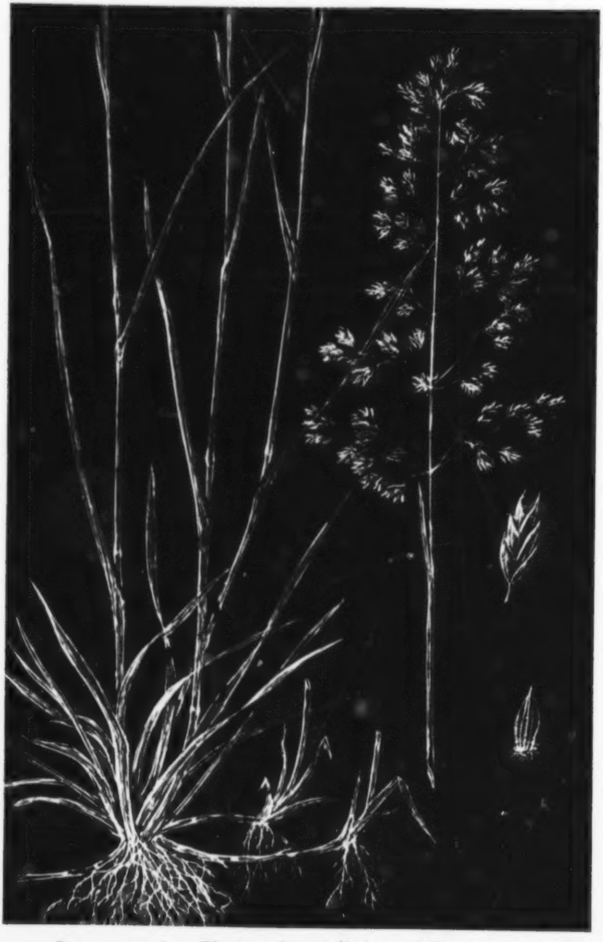
Habit: Perennial.

Culms: 1 to 1.5 m. tall.

Blades: Elongate, the uppermost nearly obsolete, 3 to 7 mm. wide.

Inflorescence: A raceme, mostly 15 to 20 cm. long, the spikelets as many as 12, about 3 cm. long, 8- to 12-flowered, finally reflexed or drooping.

Glumes: Scarious.



Poa pratensis. Plant, × ⅓; spikelet and floret, × 3.

Lemmas: About 8 mm. long, subacute, scabrous; awn 5 to 12 mm. long; palea narrow, keeled to about the middle, scarcely or minutely toothed.

Distribution: Wet meadows and mountain streams, British Columbia and Washington.

Distribution in British Columbia: Rare, only known in British Columbia from the coastal area.

45. *Poa* L. Bluegrass

Low or rather tall slender annuals or usually perennials with spikelets in open or contracted panicles, the relatively narrow blades flat, folded, or involute, ending in a boat-shaped tip.

Spikelets 2- to several-flowered, the rachila disarticulating above the glumes and between the florets, the uppermost floret reduced or rudimentary; glumes acute, keeled, somewhat unequal, the first usually 1-nerved, the second usually 3-nerved; lemmas somewhat keeled, acute or acutish, rarely obtuse, awnless, membranaceous, often somewhat scarious at the summit, 5-nerved (intermediate nerves, this is the pair between the keel and the marginal nerves, rarely obsolete), the nerves sometimes pubescent.

The bluegrasses are of great importance because of their forage value, some species being cultivated for pasture and others forming a large part of the forage on the mountain meadows of the West. The most important is *Poa pratensis*, commonly known as bluegrass or Kentucky bluegrass.

With very few exceptions, the bluegrasses are palatable and nutritious and are often the most important grasses in many parts of the West.

KEY TO THE SECTIONS OF POA

Spikelets little compressed, narrow, much longer than wide, the lemmas convex on the back, the keels obscure, the marginal and intermediate nerves usually faint. All bunch grasses.
  Lemmas crisp-puberulent on the back toward the base (the pubescence sometimes obscure or only at the very base) .... 1. *Scabrellæ*
  Lemmas glabrous or minutely scabrous, but not crisp-puberulent .... 2. *Nevadenses*
Spikelets distinctly compressed, the glumes and lemmas keeled.
  Plants annual .... 3. *Annuæ*
  Plants perennial.
    Creeping rhizomes present .... 4. *Pratenses*

- Creeping rhizomes wanting.
  - Lemmas webbed at base (web sometimes scant or obscure in *P. interior*) .... 5. *Palustres*
  - Lemmas not webbed at base (sometimes sparsely webbed in *P. fernaldiana*).
    - Lemmas pubescent on the keel or marginal nerves or both, sometimes pubescent also on the internerves .... 6. *Alpinæ*
    - Lemmas glabrous .... 7. *Epiles*

Key to the Species of Poa

1. *Scabrellæ*

- Panicle rather open, the lower branches naked at base, ascending or somewhat spreading; culms usually decumbent at base .... 1. *P. gracillima*
- Panicle contracted, the branches appressed or at anthesis somewhat spreading.
  - Culms slender, on the average less than 30 cm. tall; numerous short innovations at base. Blades usually folded .... 2. *P. secunda*
  - Culms stouter, on the average more than 50 cm. tall; innovations usually not numerous .... 3. *P. canbyi*

2. *Nevadenses*

- Sheaths scaberulous. Ligule long, decurrent .... 4. *P. nevadensis*
- Sheaths glabrous.
  - Blades involute .... 5. *P. juncifolia*
  - Blades flat .... 6. *P. ampla*

3. *Annuæ*

- Lemmas glabrous, except the scabrous keel, webbed base. Sheath glabrous. .... 7. *P. bolanderi*
- Lemmas pubescent.
  - Lemmas pubescent on the back especially toward the base, but not distinctly villose on the keel and nerves, panicle open .... 8. *P. howellii*
  - Lemmas pubescent on the nerves, sometimes also on the internerves, not webbed at base .... 9. *P. annua*

4. *Pratenses*

- Very robust grasses with coarse glaucous leaves 5 to 10 mm. wide, numerous lower panicle branches bearing spikelets to the base .... 10. *P. eminens*
- Ordinary grasses with narrower leaves, lower panicle branches not bearing spikelets to the base.
  - Culms strongly flattened, 2-edged .... 11. *P. compressa*
  - Culms terete or slightly flattened, not 2-edged.
    - Plants diœcious.
      - Glumes and lemmas about 8 mm. long .... 12. *P. macrantha*
      - Glumes and lemmas not more than 6 mm. long .... 13. *P. confinis*

Plants not diœcious, the florets perfect.
Lemmas not pubescent nor webbed .... 14. *P. nervosa*
Lemmas pubescent.
Internerves glabrous, the keel and the marginal nerves pubescent.
Culms retrorsely scabrous .... 15. *P. laxiflora*
Culms glabrous .... 16. *P. pratensis*
Internerves pubescent near base, the keeled and marginal nerves pubescent.
Panicle contracted, sometimes open, the branches ascending or appressed .... 17. *P. glaucifolia*
Panicle open, the branches spreading.
Spikelets violet or greyish-violet with brown tips of the scales, lemma and with often profuse, lanate hairs below .... 18. *P. lanata*
Spikelets green or green with brown tips of the scales, lemmas, with scattered, less lanate, often straight hairs below .... 19. *P. arctica*

5. *Palustres*

Lemmas glabrous, or the keel sometimes pubescent.
Sheaths retrorsely scabrous. Culms decumbent and often rooting at base .... 20. *P. trivialis*
Sheaths glabrous, panicle narrow .... 21. *P. marcida*
Lemmas pubescent on keel and marginal nerves.
Sheaths distinctly scabrous, culms usually stout .... 22. *P. occidentalis*
Sheaths glabrous or faintly scaberulous.
Lower panicle branches distinctly reflexed at maturity .... 23. *P. reflexa*
Lower panicle branches not reflexed.
Lower panicle branches in pairs, elongate, capilliary.
Spikelets rather broad, growing in alpine rocky slopes .... 24. *P. paucispicula*
Spikelets narrow, growing in shady wet places .... 25. *P. leptocoma*
Lower panicle branches often more than two, if only two not capillary.
Florets usually converted into bulblets .... 26. *P. bulbosa*
Florets normal.
Glumes narrow, acuminate, about as long as the first lemma, ligule very short .... 27. *P. nemoralis*
Glumes lanceolate, acute, shorter than the first lemma, ligules rather prominent.
Culms decumbent at the purplish base .... 28. *P. palustris*
Culms erect from a green or tawny base .... 29. *P. interior*

6. *Alpineæ*

Blades folded or involute, firm, rather stiff 30. *P. fendleriana*
Blades flat or, if involute, rather lax or soft.
Panicle broadly pyramidal, condensed, about as broad as long 31. *P. alpina*
Panicle longer than broad.
Panicle nodding, the lower branches slender 32. *P. stenantha*
Panicle erect, the lower branches short.
Panicle rather loose, lower branches naked below 33. *P. glauca*
Panicle narrow, condensed, branches short 34. *P. rupicola*

7. *Epiles*

Blades scabrous, filiform, mostly basal 35. *P. cusickii*
Blades glabrous.
Blades of the culm 2 to 3 mm. wide, flat, those of the innovations slender and filiform 36. *P. epilis*
Blades of the culms and innovations similar. Panicle few-flowered 37. *P. lettermani*

1. *Poa gracillima* Vas. Pacific Bluegrass

Habit: Perennial.
Culms: Rather loosely tufted, 30 to 60 cm. tall, usually decumbent at the base.
Sheaths: Smooth.
Blades: Flat or folded, lax, from filiform to 1.5 mm. wide.
Inflorescence: A panicle, pyramidal, loose, rather open, 5 to 10 cm. long, the branches in whorls, the lower in twos to sixes, spreading or sometimes reflexed, naked below.
Spikelets: 4 to 6 mm. long.
Glumes: Second glume 3 to 4 mm. long.
Lemmas: Minutely scabrous, crisp-pubescent near base, especially on the nerves.
Ligule: 2 to 5 mm. long.
Distribution: Cliffs and rocky slopes, Alberta to Alaska, south to Colorado and California.
Distribution in British Columbia: Rogers Pass, Okanagan. Widely distributed but not abundant.

2. *Poa secunda* Presl. Sandberg Bluegrass

Poa sandbergii Vasey.
Habit: Perennial.
Culms: Erect from a dense, often extensive, tuft of short basal foliage, up to 30 cm. tall.
Sheaths: Glabrous.

Blades: Rather short, soft, flat, folded, or involute.

Inflorescence: A narrow panicle, 2 to 10 cm. long, the branches short, appressed, or somewhat spreading in anthesis.

Spikelets: 5 to 7 mm. long.

Glumes: About 4 mm. long, glabrous except the keel.

Lemmas: Pubescent on the lower half, especially on the keel and toward the margins.

Distribution: Plains, dry woods, rocky slopes, at medium and upper altitudes, North Dakota to the Yukon, south to Nebraska and California.

Distribution in British Columbia: One of the commonest range grasses of the Interior.

3. *Poa canbyi* (Scribn.) Piper. Canby Bluegrass

Poa lucida Vasey.

Poa laevigota Scribn.

Habit: Perennial.

Culms: Green or glaucous; 50 to 120 cm. tall.

Sheaths: Smooth or nearly so.

Blades: Flat or folded.

Inflorescence: A narrow panicle, compact or rather loose, 10 to 15 cm. long, sometimes as much as 20 cm., the branches short, appressed.

Spikelets: 3- to 5-flowered.

Glumes: 4 to 5 mm. long, acute.

Lemmas: More or less crisp-pubescent on lower part of back.

Ligule: 2 to 5 mm. long.

Distribution: Sandy or dry ground, Minnesota to the Yukon, south to Nebraska, Colorado, and Washington.

Distribution in British Columbia: Victoria, Field, and Quesnel Dam.

4. *Poa nevadensis* Vasey ex Scribn. Nevada Bluegrass

Habit: Perennial.

Culms: Erect, 50 to 100 cm. tall.

Sheaths: Scabrous, sometimes only slightly so.

Blades: Usually elongate, narrow, involute, sometimes almost capillary, rather stiff.

Inflorescence: A narrow panicle, 10 to 15 cm. long, pale, rather loose, the branches short-appressed.

Spikelets: 3- to 5-flowered, 6 to 8 mm. long.

Glumes: Narrow, the second about as long as the lowest floret.

Lemmas: 4 to 5 mm. long, rather obtuse at the scarious tip.

Ligule: About 4 mm. long.

Distribution: Low meadows and wet places, Montana to British Columbia, south to Colorado, Arizona, and California.

Distribution in British Columbia: Esquimalt, Kamloops, Crowsnest Pass.

5. *Poa juncifolia* Scribn. Alkali Bluegrass

Poa brachyglossa Piper.
Habit: Tufted perennial.
Culms: Erect, 50 to 100 cm. tall.
Sheaths: Smooth.
Blades: Involute, smooth, rather stiff.
Inflorescence: A narrow panicle, 10 to 20 cm. long, the branches appressed.
Spikelets: 3- to 6-flowered, 7 to 10 mm. long.
Glumes: About equal.
Lemmas: About 4 mm. long.
Ligule: Short, those of the innovations not visible from the sides.
Distribution: Alkaline meadows, Montana to British Columbia, south to South Dakota, Colorado, and California.
Distribution in British Columbia: Nicola, Merritt, Williams Lake, and the Chilcotin. Widely distributed in the dry belt.

6. *Poa ampla* Merr. Big Bluegrass

Habit: Perennial.
Culms: 80 to 120 cm. tall.
Sheaths: Smooth, rarely scaberulous.
Blades: 1 to 3 mm. wide.
Inflorescence: A narrow panicle, 10 to 15 cm. long, usually rather dense.
Spikelets: 4- to 7-flowered, 8 to 10 mm. long.
Glumes: Scabrous on the keel, the upper 5 to 6 mm. long.
Lemmas: Firm, 4 to 6 mm. long.
Ligule: Short, rounded.
Distribution: Meadows and moist open ground or dry slopes, North Dakota to the Yukon, south to Nebraska and California.
Distribution in British Columbia: Southern border and the Interior.

7. *Poa bolanderi* Vasey

Habit: Annual.
Culms: Erect, 15 to 60 cm. tall.
Sheaths: Glabrous.
Blades: Relatively short, 3 to 5 mm. wide, abruptly narrowed at the tip.
Inflorescence: A panicle, about half the length of the entire plant, at first contracted, finally open, the branches few, distant, glabrous, stiffly spreading, naked below.
Spikelets: Usually 2- or 3-flowered, the internodes of the rachilla long.
Glumes: Broad, 2 and 3 mm. long.
Lemmas: Scantily webbed at base, acute, the marginal nerves rather indistinct, the intermediate nerves obsolete.
Distribution: Open ground or open woods, 4,500 to 9,000 feet, British Columbia, Idaho, and south to California.
Distribution in British Columbia: Sooke. Listed in Macoun's catalogue, Parts 4, 5. 1888.

8. *Poa howellii* Vasey & Scribn. Howell Bluegrass

Habit: Annual.
Culms: 30 to 85 cm. tall.
Sheaths: Retrorsely scabrous to glabrous.
Blades: Wider than in *P. bolanderi*, gradually acuminate.
Inflorescence: A panicle, one-third to half the entire height of the plant, open, the branches in rather distant fascicles, spreading, scrabrous, naked below, some short branches intermixed.
Spikelets: 3 to 5 mm. long, usually 3- to 4-flowered.
Glumes: Narrow, acuminate, 1.5 and 2 mm. long.
Lemmas: Webbed at base, 2 to 3 mm. long, ovate-lancelate, pubescent on the lower part, the nerves all rather distinct.
Distribution: Rocky banks and shaded slopes, mostly less than 3,000 feet, British Columbia to southern California.
Distribution in British Columbia: Dry woods, Goldstream.

9. *Poa annua* L. Annual Bluegrass

Habit: Tufted annual.
Culms: Flattened, usually 5 to 20 cm. tall, sometimes taller, forming mats, and sometimes rooting at the lower nodes.
Sheaths: Glabrous.
Blades: Soft, lax, mostly 1 to 3 mm. wide.
Inflorescence: A pyramidal panicle, open, 3 to 7 cm. long.
Spikelets: Crowded, 3- to 6-flowered, about 4 mm. long.
Glumes: First glume 1.5 to 2, the second 2 to 2.5 mm. long.
Lemmas: Not webbed at base, distinctly 5-nerved, more or less pubescent on the lower half of all the nerves, the long hairs on the lower part of the keel sometimes simulating a web.
Distribution: Open ground, lawns, pastures, waste places, Newfoundland to British Columbia, south to Florida and California. Introduced from Europe.
Distribution in British Columbia: Very common on roadsides and lawns.
Remarks: Sometimes a troublesome weed in lawns, growing luxuriantly in spring, dying in early summer and leaving unsightly patches.

10. *Poa eminens* Presl.

Habit: Creeping rooted perennial.
Culms: Glaucous, 40 to 100 cm. tall.
Blades: Thick, 4 to 8 mm. wide.
Inflorescence: A dense panicle, 10 to 20 cm. long, contracted.
Spikelets: 10 to 14 mm. long, 3- to 6-flowered.
Glumes: Up to 1 cm. long.
Lemmas: 5 to 6 mm. long, lacinate at the hyaline tip, pubescent at the base and lower part of the midrib and nerves.

Distribution: Not found in the United States. Occurs in Labrador and Quebec and from Alaska to the west coast of Vancouver Island. Type from Nootka according to Hulten.

11. *Poa compressa* L. Canada Bluegrass

Habit: Perennial with creeping rhizomes.
Culms: Solitary or few together, often gregarious, strongly flattened, wiry, decumbent at the base, bluish green, 15 to 70 cm. tall.
Blades: Mostly rather short, 1 to 4 mm. wide.
Inflorescence: A narrow panicle, 3 to 10 cm. long, the usually short branches in pairs, spikelet-bearing to the base.
Spikelets: Crowded, subsessile, 3- to 6-flowered, 4 to 6 mm. long.
Glumes: 2 to 3 mm. long.
Lemmas: Firm, 2 to 3 mm. long, the web at the base scant or wanting, the keel and marginal nerves slightly pubescent toward the base, the intermediate nerves obscure.
Distribution: Open ground, meadows, and waste places, Newfoundland to Alaska, south to Georgia, Oklahoma, and California.
Distribution in British Columbia: Sidney, Salmon Arm, Williams Lake, and Prince George.
Remarks: Cultivated for pastures in poor soil. Introduced from Europe.

12. *Poa macrantha* Vasey

Habit: Perennial with creeping rhizomes. Plants diœcious.
Culms: Erect from a decumbent base, with extensively creeping rhizomes, and also long runners creeping over the sand, 15 to 40 cm. tall.
Sheaths: Tawny, papery.
Blades: Involute, subflexuous.
Inflorescence: A contracted panicle, sometimes dense and spike-like, 5 to 12 cm. long, pale or tawny.
Spikelets: About 12 mm. long, about 5-flowered.
Glumes: 3-nerved, or second indistinctly 5-nerved, about 8 mm. long.
Lemmas: About 8 mm. long, short-webbed at base, pubescent on the keel and marginal nerves below, slightly scabrous on the keel above; pistillate florets with abortive stamens.
Distribution: Sand dunes along the coast, British Columbia to northern California.
Distribution in British Columbia: Clayoquot, Saanich Spit, and Calvert Island.

13. *Poa confinis* Vasey

Habit: Creeping rooted perennial. Plants diœcious, the two kinds similar.
Culms: Often geniculate at the base, usually less than 15 cm. tall, sometimes as much as 30 cm.
Blades: Involute, those of the innovations numerous.

Inflorescence: A narrow panicle, 1 to 3 cm. long, tawny, the short branches ascending or appressed.

Spikelets: 4 to 5 mm. long, mostly 3- or 4-flowered.

Glumes: Unequal, the second 3 mm. long.

Lemmas: 3 mm. long, scaberulous, sparsely webbed at the base, the nerve faint; pistillate florets with minute abortive anthers, the staminate often with rudimentary pistile.

Distribution: Sand dunes and sandy meadows near the coast, British Columbia to California.

Distribution in British Columbia: Coast of Vancouver Island.

14. *Poa nervosa* (Hook.) Vasey. Wheeler Bluegrass

Poa wheeleri Vasey.

Habit: Creeping rooted perennial.

Culms: Erect, 30 to 60 cm. tall.

Sheaths: Glabrous or the lower retrorsely pubescent, often purple, the collar often puberulent.

Blades: Sometimes folded.

Inflorescence: An open panicle, usually 5 to 10 cm. long, the apex nodding, the branches mostly in twos or threes, naked below.

Lemmas: Rather strongly nerved, glabrous or pubescent on the lower part of the nerves.

Ligule: 1 to 2 mm. long.

Distribution: Open woods at medium altitudes, Alberta and British Columbia, south in the mountains to Colorado and California.

Distribution in British Columbia: Penticton, Chezacut, Ootsa Lake, and Smithers.

15. *Poa laxiflora* Buckl.

Habit: Perennial with creeping rhizomes.

Culms: Retrorsely scabrous, 100 to 120 cm. tall.

Sheaths: Slightly retrorse-scabrous.

Blades: Lax, 2 to 4 mm. wide.

Inflorescence: A loose open panicle, nodding or drooping, 10 to 15 cm. long, the lower branches in whorls of 3 or 4.

Spikelets: 3- or 4-flowered, 5 to 6 mm. long.

Lemmas: About 4 mm. long, webbed at the base, rather sparsely on the lower part of the nerves.

Ligule: 3 to 5 mm. long.

Distribution: Moist woods, Alaska, Olympic Mountains, and Oregon.

Distribution in British Columbia: Apparently a rare grass not yet collected in British Columbia but expected because of its distribution.

16. *Poa pratensis* L. Kentucky Bluegrass

Habit: Perennial with creeping rhizomes.

Culms: Tufted, erect, slightly compressed, 30 to 100 cm. tall.

Sheaths: Somewhat keeled.

Blades: Soft, flat or folded, mostly 2 to 4 mm. wide, the basal often elongated.

Inflorescence: A panicle, pyramidal or oblong-pyramidal, open, the lowermost branches usually in a whorl of 5, ascending or spreading, naked below, normally 1 central long one, 2 shorter lateral ones, and 2 short intermediate ones.

Spikelets: Crowded, 3- to 5-flowered, 3 to 6 mm. long.

Lemmas: Copiously webbed at base, silky-pubescent on lower half or two-thirds of the keel and marginal nerves, the intermediate nerves distinct glabrous.

Ligules: About 2 mm. long.

Distribution: Open woods, meadows, and open ground over most of North America.

Remarks: Bluegrass is commonly cultivated for lawns and pastures. Originally introduced from Europe.

17. *Poa glaucifolia* Scribn. and Will.

Habit: Perennial with creeping rhizomes.

Culms: In loose tufts, 60 to 100 cm. tall.

Blades: 2 to 3 mm. wide.

Inflorescence: A narrow panicle, open, mostly 10 to 20 cm. long, the branches usually in somewhat distant whorls, mostly in threes, ascending, very scabrous, naked below.

Spikelets: 2- to 4-flowered.

Glumes: 4 to 5 mm. long.

Lemmas: About 4 mm. long, villose on the lower half of the keel and marginal nerves and more or less so on the intermediate nerves below.

Distribution: Moist places, ditches, and open woods at medium altitudes, British Columbia and Alberta through Idaho to Minnesota, Arizona, and Nevada.

Distribution in British Columbia: Tetana Lake.

18. *Poa lanata* Scribn. & Merr.

Habit: Perennial with creeping rhizomes.

Culms: Erect, 25 to 40 cm. tall, usually with only 1 leaf.

Blades: Glaucous, rather rigid, 2 to 4 mm. wide, acute and hooded at the apex.

Inflorescence: An open panicle, 5 to 12 cm. long, the branches mostly in twos.

Spikelets: Ovate, acute, purplish or brownish, compressed, 8 to 10 mm. long, 3- to 6-flowered.

Glumes: Acute, 3-nerved, scabrous on the keel.

Lemmas: 6 to 7 mm. long, with broad hyaline margins, 5-nerved, obtuse, densely webbed on the lower half, strigose above.

Distribution: Aleutian Islands to Athabaska Lake in British Columbia.

Distribution in British Columbia: Possibly only in northern British Columbia (Anderson).

19. *Poa arctica* R. Br. Arctic Bluegrass

Poa grayana Vasey.

Poa aperta Scribn. & Merr.

Habit: Perennial with creeping rhizomes.

Culms: Loosely tufted, erect from a decumbent base, 10 to 30 cm. tall.

Blades: Mostly basal, flat or folded, mostly 2 to 3 mm. wide, 1 short blade about the middle of the culm.

Inflorescence: An open panicle, pyramidal, 5 to 10 cm. long, the lower branches usually 2, spreading, sometimes reflexed, bearing a few spikelets toward the tip.

Spikelets: 5 to 8 mm. long, 3- or 4-flowered.

Lemmas: Densely villous on the keel and marginal nerves and pubescent on the lower part of the internerves, the base often webbed.

Ligule: Pointed, up to 4 mm. long.

Distribution: Meadows, mostly above timber-line, Arctic regions, south to Nova Scotia, and in the mountains to Nevada and California.

Distribution in British Columbia: Mount Ferguson, Ootsa Lake, McBride, and Smithers.

20. *Poa trivialis* L. Rough-stalked Meadow Bluegrass

Habit: Tufted perennial.

Culms: Erect from a decumbent base, often rather lax, scabrous below the panicle, 30 to 100 cm. tall.

Sheaths: Retrorsely scabrous or scaberulous at least toward the summit.

Blades: Scabrous, 2 to 4 mm. wide.

Inflorescence: An oblong panicle, 6 to 15 mm. long, the lower branches about 5 in a whorl.

Spikelets: Usually 2- or 3-flowered, about 3 mm. long.

Glumes: Narrow, acute or acuminate, often incurved.

Lemmas: 2.5 to 3 mm. long, glabrous except the slightly pubescent keel, or lateral nerves rarely pubescent, the web at base conspicuous, the nerves prominent.

Ligule: 4 to 6 mm. long.

Distribution: Moist places, Newfoundland and Ontario to North Carolina, Minnesota, and Colorado; on the Pacific Coast from southern Alaska to Northern California. Introduced from Europe.

Distribution in British Columbia: Vancouver Island and Lower Mainland.

21. *Poa marcida* Hitchc. Weak Bluegrass

Habit: Tufted perennial.

Culms: Erect, in small tufts, 40 to 100 cm. tall.

Sheaths: Glabrous.

Blades: Thin, 1 to 3 mm. wide.

Inflorescence: A drooping panicle, narrow, 10 to 18 cm. long, the capillary branches somewhat distant, solitary or in pairs, ascending or appressed.

Spikelets: Mostly 2-flowered.

Glumes: About 3 mm. long.

Lemmas: Narrowly lanceolate, acuminate, 4 to 5 mm. long, glabrous, long-webbed at base.

Ligule: Very short.

Distribution: Bogs and wet places, British Columbia to the coast mountains of Oregon.

Distribution in British Columbia: Vancouver Island and Vancouver.

22. *Poa occidentalis* Vasey. New Mexican Bluegrass

Habit: Tufted perennial.

Culms: Erect, a few in a tuft, usually rather stout, scabrous, as much as 1 to 1.5 m. tall.

Sheaths: Somewhat keeled, retrorsely scabrous.

Blades: Scabrous, 10 to 20 cm. long, 3 to 6 mm. wide.

Inflorescence: An open panicle, 15 to 30 cm. long, the branches in distant whorls of threes to fives, spreading to reflex, the lower as much as 10 cm. long, spikelet-bearing toward the end.

Spikelets: 3- to 6-flowered.

Lemmas: 4.5 to 5 mm. long, conspicuously webbed at base, villous on the lower part of the keel and the marginal nerves and sometimes sparsely pubescent on the internerves below.

Ligule: 2 to 8 mm. long.

Distribution: Open woods and moist banks at medium altitudes, British Columbia, Wyoming to New Mexico.

Distribution in British Columbia: Only one collection, and that at Allison Pass.

23. *Poa reflexa* Vasey and Scribn. Nodding Bluegrass

Habit: Tufted perennial.

Culms: Solitary or in small tufts, erect, 20 to 40 cm. tall.

Sheaths: Smooth.

Blades: Rather short, 1 to 4 mm. wide.

Inflorescence: A nodding panicle, 5 to 15 cm. long, the branches naked below, solitary, in pairs or in threes, the lower usually reflexed, sometimes strongly so.

Spikelets: 2- to 4-flowered.

Glumes: Unequal, scabrous on the keel.

Lemmas: About 3 mm. long, oblong-eliptic, webbed at the base, villous on the keel and marginal nerves, sometimes on the intermediate nerves.

Distribution: Open slopes and alpine meadows at 6,000 to 12,000 feet, Montana to British Columbia, south in the mountains to New Mexico and Arizona.

Distribution in British Columbia: Glacier.

24. *Poa paucispicula* Scribn. & Merr.

Habit: Tufted perennial.

Culms: Tufted, leafy, rather lax, 10 to 30 cm. tall, the base often decumbent.

Blades: 1 to 2 mm. wide.

Inflorescence: A lax panicle, few-flowered, 2 to 8 cm. long, the branches in pairs or solitary, naked below.

Spikelets: Ovate, purple, 4 to 6 mm. long, 2- to 5-flowered.

Glumes: Rather broad, acute, 3 to 4 mm. long.

Lemmas: 3 to 4 mm. long, oblong, obtuse, webbed at base (the web sometimes scant), pubescent on the keel and marginal nerves below.

Distribution: Rocky slopes, Alaska to Washington, Glacier National Pank, Montana.

Distribution in British Columbia: Mount Garibaldi and Omineca Mountain.

Remarks: More leafy than *P. leptocoma,* more tufted, the panicle branches not so long; spikelets broader.

25. *Poa leptocoma* Trin. Bog Bluegrass

Habit: Tufted perennial.

Culms: Slender, solitary, or a few in a tuft, 20 to 50 cm. tall, often decumbent at the base.

Sheaths: Usually slightly scabrous.

Blades: Short, lax, mostly 2 to 4 mm. wide.

Inflorescence: A nodding, delicate panicle, few-flowered, the branches capillary, ascending or spreading, subflexuous, the lower mostly in pairs.

Spikelets: Narrow, 2- to 4-flowered.

Glumes: Narrow, acuminate.

Lemmas: 3.5 to 4.5 mm. long, acuminate, webbed at the base, pubescent on the the keel and marginal nerves or sometimes nearly glabrous, the intermediate nerves distinct.

Ligule: Acute, the uppermost 3 to 4 mm. long.

Distribution: Bogs, Alaska, south in the mountains to Colorado and California.

Distribution in British Columbia: Garibaldi, between Ootsa and Francois Lakes, McBride, and Smithers.

26. *Poa bulbosa* L. Bulbous Bluegrass

Habit: Tufted perennial.

Culms: Densely tufted, more or less bulbous at the base, 30 to 60 cm. tall.

Sheaths: Glabrous.

Blades: Flat or loosely involute, 1 to 2 mm. wide.

Inflorescence: An ovoid panicle, mostly 5 to 8 cm. long, somewhat contracted, the branches ascending or appressed, some floriferous to the base.

Spikelets: The florets converted into bulblets with a dark purple base about 2 mm. long, the bracts extending into slender green tips 5 to 15 mm. long; unaltered spikelets about 5-flowered, apparently not perfecting seed.

Lemmas: 2.5 mm. long, webbed at the base, densely silky on the keel and marginal nerves, the intermediate nerves faint.

Distribution: Fields and meadows, North Dakota to British Columbia, south to California, Colorado, and Oklahoma.

Distribution in British Columbia: Established in Beacon Hill Park, Victoria, since 1921; Kamloops, Armstrong, and Grand Forks.

Remarks: Introduced from Europe as a forage grass.

27. *Poa nemoralis* L. Wood Bluegrass

Habit: Tufted perennial.

Culms: Tufted, 30 to 70 cm. tall.

Sheaths: Glabrous.

Blades: Rather lax, about 2 mm. wide.

Inflorescence: A panicle, 4 to 10 cm. long, the branches spreading.

Spikelets: 2- to 5-flowered, 3 to 5 mm. long.

Glumes: Narrow, sharply acuminate, about as long as the first floret.

Lemmas: 2 to 3 mm. long, sparsely webbed at the base, pubescent on the keel and marginal nerves, the intermediate nerves obscure.

Ligule: Very short.

Distribution: Labrador to Alaska and British Columbia, occasionally in meadows on the eastern seaboard. Introduced from Europe.

Distribution in British Columbia: Glacier, Victoria, Tetana Lake, Field, and Vancouver.

28. *Poa palustris* L. Fowl Bluegrass

Poa triflora Gilib.

Habit: Tufted perennial.

Culms: Loosely tufted, glabrous, decumbent at the flattened purplish base, 30 to 120 cm. tall.

Sheaths: Keeled, sometimes scaberulous.

Blades: 1 to 2 mm. wide.

Inflorescence: A pyramidal panicle or oblong, nodding, yellowish-green or purplish, 10 to 30 cm. long, the branches in rather distant fascicles, naked below.

Spikelets: 2- to 4-flowered, about 4 mm. long.

Glumes: Lanceolate, acute, shorter than the first floret.

Lemmas: 2.5 to 3 mm. long, usually bronze at the tip, webbed at the base, villous on the keel and marginal nerves.

Ligule: 3 to 5 mm. long, or only 1 mm. on the innovations.

Distribution: Meadows and moist open ground, at low and medium altitudes, Newfoundland to Alaska, south to Virginia, Nebraska, and California.

Distribution in British Columbia: Okanagan, Skeena Valley, Nelson, and Manning Park. Widely distributed and abundant.

29. *Poa interior* Rydb. Inland Bluegrass

Habit: Tufted perennial.

Culms: Erect from a usually densely tufted erect base, commonly rather stiff, often scabrous below the panicle, 20 to 50 cm. tall.

Sheaths: Slightly keeled or terete.

Blades: 1 to 2 mm. wide.

Inflorescence: A panicle, narrowly pyramidal, 5 to 10 cm. long, the branches ascending, the lower 2 or 3 spikelets about 4 mm. long.

Spikelets: 2- to 4-flowered.

Glumes: Relatively broad, acute to acuminate.

Lemmas: 3 to 3.5 mm. long, webbed at base (the web sometimes scant or obscure), villous on the lower half of the keel and marginal nerves, the intermediate nerves faint.

Ligule: Usually less than 1 mm. long.

Distribution: Grassy slopes and open woods at medium altitudes, usually not extending much above timber-line, Quebec to British Columbia and Washington, south to Vermont, Minnesota, and Arizona.

Distribution in British Columbia: Widely distributed east of the Cascades, north to latitude 54°.

30. *Poa fendleriana* (Steud.) Vasey

Habit: Tufted perennial, incompletely diœcious.

Culms: Erect, tufted, scabrous below the panicle, 30 to 50 cm. tall.

Sheaths: Somewhat scabrous.

Blades: Mostly basal, folded to involute, firm and stiff.

Inflorescence: A panicle, long-exserted, oblong, contracted, pale, 2 to 7 cm. long.

Spikelets: 4- to 6-flowered, about 8 mm. long.

Glumes: Broad, 3 to 4 mm. long.

Lemmas: 4 to 5 mm. long, villous on the lower part of the keel and marginal nerves, the intermediate nerves obscure; pistillate spikelets with minute stamens, the anthers about 0.2 mm. long.

Ligule: Less than 1 mm. long, not noticeable viewed from the side of the sheath.

Distribution: Open dry woods and rocky woods at medium altitudes, Manitoba to British Columbia, south to Nebraska, Idaho, and California.

Distribution in British Columbia: Nicola, Tranquille, and Spences Bridge.

31. ***Poa alpina*** **L. Alpine Bluegrass**

Habit: Tufted perennial.

Culms: Erect from a rather thick vertical crown, rather stout, 10 to 30 cm. tall.

Sheaths: Glabrous.

Blades: Short, 2 to 5 mm. wide, the uppermost about the middle of the culm.

Inflorescence: A panicle, ovoid or short-pyramidal, rather compact, 1 to 8 cm. long, the lower branches often reflexed.

Spikelets: Broad, purple or purplish.

Glumes: Broad, abruptly acute.

Lemmas: 3 to 4 mm. long, strongly villous on the keel and marginal nerves, pubescent on the internerves below, the intermediate nerves faint.

Distribution: Mountain meadows, arctic regions of the Northern Hemisphere, extending south to Michigan, Colorado, and Oregon.

Distribution in British Columbia: Garibaldi, Windermere, Manning Park, Mount Cheam, and Forbidden Plateau. One of the commonest alpine grasses.

32. ***Poa stenantha*** **Trin.**

Habit: Tufted perennial.

Culms: Tufted, 30 to 50 cm. tall.

Blades: Flat or loosely involute, rather lax, mostly basal, 1 to 2 mm. wide, the uppermost culm leaf below the middle of the culm.

Inflorescence: A nodding panicle, 5 to 15 cm. long, the branches in twos or threes, drooping, naked below, with a few spikelets at the ends.

Spikelets: 3- to 5-flowered, 6 to 8 mm. long.

Glumes: Strongly 3-nerved.

Lemmas: About 5 mm. long, pubescent on the lower part of keel and marginal nerves, sparsely on the internerves below.

Ligule: Prominent, as much as 5 mm. long.

Distribution: Moist open ground, Alaska, Alberta, and British Columbia, extending into Montana, Colorado, and Washington.

Distribution in British Columbia: Shore of Garibaldi Lake, New Denver, Manning Park, and Smithers.

33. ***Poa glauca*** **Vahl.**

Habit: Tufted perennial.

Culms: Compressed, stiff, 10 to 30 cm. tall, naked above, the uppermost leaf usually much below the middle.

Blades: Mostly basal, 3 to 5 cm. long, 1 to 2 mm. wide.

Inflorescence: A panicle, 3 to 7 cm. long, narrow, sometimes rather compact, the branches erect or ascending, few-flowered.

Spikelet: Mostly 2- or 3-flowered, 5 to 6 mm. long.

Lemmas: 3 to 4 mm. long, strongly pubescent on the lower half of the keel and marginal nerves and often slightly pubescent on the faint intermediate nerves.

Ligule: About 2 mm. long.

Distribution: Rocky slopes, Arctic regions south to Wisconsin, Minnesota, and Colorado.

Distribution in British Columbia: Henry reports it for Spences Bridge and eastward and northward, but probably confused with *P. secundo*.

34. ***Poa rupicola*** **Nash. Timberline Bluegrass**

Habit: Tufted perennial.

Culms: Densely tufted, erect, rather stiff, often scaberulous below the panicle, 10 to 20 cm. tall.

Sheaths: Smooth.

Blades: Short, 1 to 1.5 mm. wide.

Inflorescence: A narrow panicle, purplish, 2 to 4 cm. long, the short branches ascending or appressed.

Spikelets: Usually purple, about 3-flowered.

Lemmas: Villous below on the keel and marginal nerves and sometimes pubescent on the internerves below.

Distribution: Rocky slopes, British Columbia, south in the mountains, at high altitudes, South Dakota and Montana to Oregon and California.

Distribution in British Columbia: Mount Waddington, Paradise Mine, and Windermere.

35. ***Poa cusickii*** **Vasey. Cusick Bluegrass**

Habit: Tufted perennial.

Culms: In large tufts, erect, 20 to 60 cm. tall.

Sheaths: Glabrous.

Blades: Filiform, erect, scabrous, mostly basal.

Inflorescence: A panicle, usually pale, tawny or purple-tinged, narrow, oblong, contracted or somewhat open at anthesis, 3 to 8 cm. long.

Spikelets: 7 to 9 mm. long.

Glumes: 3 to 4 mm. long.

Lemmas: 4.5 to 6 mm. long, smooth or scabrous.

Ligule: Very short.

Distribution: Dry or rocky slopes at medium or high altitudes, Alberta to British Columbia, south to North Dakota, Colorado, and California.

Distribution in British Columbia: Clinton.

36. ***Poa epilis*** **Scribn. Skyline Bluegrass**

Poa subpurpurea Rydb.

Habit: Tufted perennial.

Culms: Compressed, erect and rather loose to dense tufts, 20 to 40 cm. tall.

Sheaths: Glabrous.

Blades: Blades of the culm about 3, flat, 3 to 6 cm. long, 2 to 3 mm. wide, of the innovations narrow, longer and usually folded or involute.

Inflorescence: A panicle, usually condensed, ovoid, 2 to 6 cm. long, long-exserted, usually purple, the lower branches naked below, ascending or appressed.
Spikelets: 3-flowered, about 5 mm. long.
Lemmas: 4 to 5 mm. long, glabrous or minutely scabrous.
Ligule: About 3 mm. long.
Distribution: Mountain meadows, mostly above timber-line, Alberta to British Columbia, south to Colorado and California.
Distribution in British Columbia: Sandon and Kokanee Park. Probably frequent at high altitude.

37. *Poa lettermani* Vasey

Habit: Tufted perennial.
Culms: Mostly less than 10 cm. tall, usually scarcely exceeding the blades.
Blades: Lax, usually not more than 1 mm. wide.
Inflorescence: A narrow panicle, contracted, 1 to 3 cm. long.
Spikelets: 3- or 4-flowered, 4 to 5 mm. long.
Glumes: Equal, somewhat acuminate, about as long as the first and second florets.
Lemmas: Erose at the summit, 2.5 to 3 mm. long.
Ligule: 1 to 2 mm. long.
Distribution: Rocky alpine summits, British Columbia, Washington, and California.
Distribution in British Columbia: Lytton, Mount Dunn, and Chu-Chua.

46. *Polypogon* Desf.

Usually decumbent annuals or perennials with flat scabrous blades and dense, bristly spike-like panicles. Spikelets 1-flowered, the pedicel disarticulating a short distance below the glumes, leaving a short-pointed callus attached; glumes equal, entire or 2-lobed, awned from the tip of from between the lobes, the awn slender, straight; lemma much shorter than the glumes, hyaline, usually bearing a slender straight awn shorter than the awns of the glumes.

KEY TO SPECIES OF POLYPOGON

Plants annual .... 1. *P. monspeliensis*
Plants perennial .... 2. *P. interruptus*

1. *Polypogon monspeliensis* (L.) Desf. Rabbitfoot Grass

Habit: Annual.
Culms: Erect or decumbent at base, 15 to 50 cm. tall.
Sheaths: Nearly smooth.

Blades: In average plants 4 to 6 mm. wide.

Inflorescence: A dense spike-like panicle, 2 to 15 cm. long, 1 to 2 cm. wide, tawny yellow when mature.

Glumes: Hispidulous, about 2 mm. long, the awns 6 to 8 mm. long, rarely longer.

Lemmas: Smooth and shining, about half as long as the glumes, the delicate awn slightly exceeding them.

Ligule: 5 to 6 mm. long.

Distribution: Waste places, British Columbia to New Brunswick, south to Texas and California.

Distribution in British Columbia: Frequent in the Interior, around sloughs especially if alkali present.

2. *Polypogon interruptus* H. B. K. Ditch Polypogon

Habit: Perennial.

Culms: Tufted, geniculate at base, 30 to 80 cm. tall.

Blades: Commonly 4 to 6 mm. wide.

Inflorescence: An oblong panicle, 5 to 15 cm. long, more or less interrupted or lobed.

Glumes: Equal, 2.5 to 3 mm. long, scabrous, the awns 3 to 5 mm. long.

Lemmas: Smooth and shining, 1 mm. long, minutely toothed at the truncate apex, the awn exceeding the glumes.

Ligule: 2 to 5 mm. long or the uppermost longer.

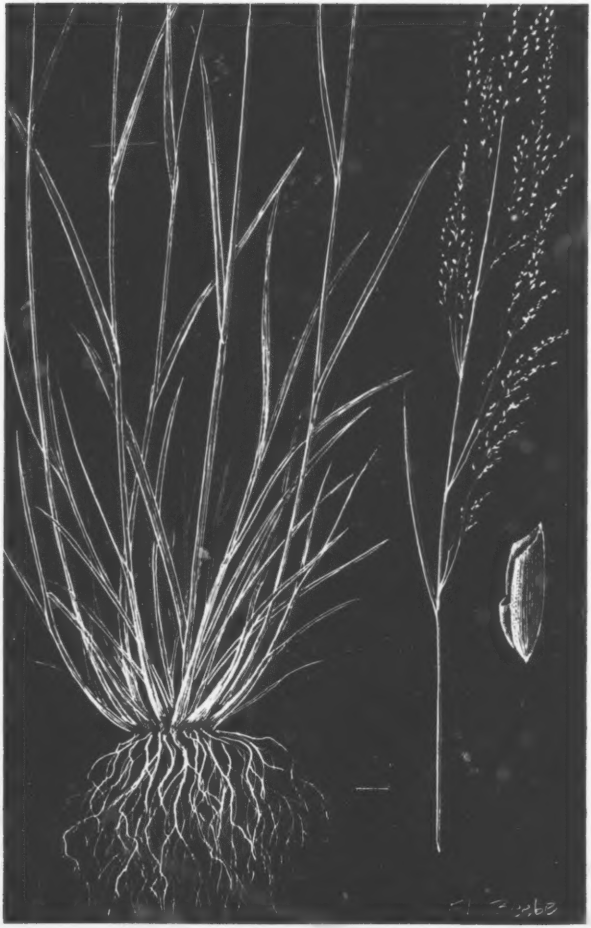
Distribution: Ditches and wet places at low altitudes, British Columbia to California, east to Louisiana.

Distribution in British Columbia: Reported in Macoun's Cat. Can. Plants, Part IV, 1888, as *P. littoralis,* as occurring on refuse heaps, James Bay, Victoria. Not collected for many years. A casual from Europe, which apparently has not established itself.

47. *Puccinellia* Parl. Alkali-grass

Low, pale, smooth-tufted annuals or perennials with narrow to open panicles. Spikelets several-flowered, articulating above the glumes and below the florets; glumes unequal, shorter than the first lemma, obtuse or acute, rather firm, often scarious at tip, the first usually 1-nerved and the second 3-nerved. Lemmas rounded on the back, acute or obtuse, usually scarious and often erose at the tip, glabrous or puberulent toward base, rarely pubescent on the nerves, 5-nerved, the nerves parallel, indistinct; palea about as long as lemma.

Puccinellia airoides furnishes considerable forage in the regions where it is common. A form of this called Zawadke alkali-grass is cultivated in Montana.



Puccinellia airoides. Plant, ×½; floret, ×8.

Key to the Species of Puccinellia

- Lemmas about 2 mm. long; panicle open; the slender branches spreading or reflexed.
  - Lemmas narrow, narrowed into obtuse apex; panicle branches spreading, usually not reflexed .... 1. *P. airoides*
  - Lemmas broad, obtuse or truncate, not narrowed above; lower panicle branches usually reflexed .... 2. *P. distans*
- Lemmas 3 to 4 mm. long; panicle narrow, the branches ascending or finally spreading.
  - Panicle branches glabrous or essentially so.
    - Scales erose in the margin .... 3. *P. nutkænsis*
    - Scales not erose in the margin .... 4. *P. pumila*
  - Panicle branches distinctly scabrous .... 5. *P. grandis*

1. ***Puccinellia airoides*** **(Nutt.) Wats. & Coult.** **Nuttall Alkali-grass**

Puccinellia nuttalliana (Schult.) Hitchc.

Habit: Tufted perennial.

Culms: Usually erect, slender, rather stiff and firm at base, mostly 30 to 60 cm. tall.

Sheaths: Loose.

Blades: 1 to 3 mm. wide, flat, or becoming involute.

Inflorescence: A pyramidal panicle, open, mostly 10 to 20 cm. long, the spreading branches as much as 10 cm. long.

Spikelets: 3- to 6-flowered, 4 to 7 mm. long, the florets rather distant, the rachilla often exposed; pedicel scabrous.

Glumes: 1.5 to 2 mm. long.

Lemmas: 2 to 3 mm. long, rather narrow, somewhat narrowed into an obtuse apex; anthers about 0.7 mm. long.

Distribution: Moist, usually alkaline soil, British Columbia to Wisconsin, south to Kansas and California.

Distribution in British Columbia: Chilcotin, Kelowna, Cariboo Road, and Columbia Valley.

2. ***Puccinellia distans*** **(L.) Parl.**

Habit: Closely clustered perennial.

Culms: Erect or decumbent at base, 20 to 40 cm. tall, sometimes taller.

Sheaths: Scaberous.

Blades: Flat or more or less involute, mostly 2 to 4 mm. wide.

Inflorescence: Pyramidal panicle, loose, 5 to 15 cm. long, the branches fascicled, rather distant, the lower spreading or finely reflexed, the longer ones naked half their length or more.

Spikelets: 4- to 6-flowered, 4 to 5 mm. long.

Glumes: 1 and 2 mm. long.

Lemmas: Rather thin, obtuse or truncate, 1.5 to usually about 2 mm. long, with a few short hairs at base; anthers about 0.8 mm. long.

Distribution: Moist more or less alkaline soil, British Columbia to Quebec, south to Maryland and California.
Distribution in British Columbia: Kamloops, Lac la Hache, and the Cariboo.
Remarks: Introduced from Eurasia.

3. *Puccinellia nutkœnsis* (Presl.) Fern. & Weath.

Habit: Perennial.
Culms: 20 to 60 cm. tall, usually erect.
Sheaths: Smooth.
Blades: 1 to 2 mm. wide, flat or subinvolute.
Inflorescence: A narrow panicle, 5 to 20 cm. long, the few, slender, branches appressed, smooth or nearly so.
Spikelets: 6 to 9 mm. long, 4- to 9-flowered.
Glumes: About 1.5 and 2.5 mm. long.
Lemmas: About 3 mm. long, narrowed to an obtuse, erose, or minutely fimbriate apex; anthers 0.8 to 1 mm. long.
Distribution: Wet saline soil near the coast, British Columbia to California.
Distribution in British Columbia: Vancouver Island, Nootka, and West Vancouver.
Remarks: The revised Hitchcock states that this is a northern species and does not occur in the United States. However, Anderson gives the range as British Columbia to California, and Hulten states that it occurs from Alaska along the coast to California.

4. *Puccinellia pumila* (Vasey) Hitchc.

Puccinellia argustata (R. Br.) Nash.
Habit: Perennial.
Culms: Lax, erect or ascending from a decumbent base, 10 to 30 cm. tall.
Sheaths: Smooth.
Blades: Rather soft, mostly flat, 1 to 2 mm. wide.
Inflorescence: A pyramidal panicle, open, mostly 5 to 10 cm. long, lower branches naked below, usually finely spreading or evenly reflexed.
Spikelets: 4- to 6-flowered.
Glumes: 1.5 and 2.5 mm. long.
Lemmas: 3 to 4 mm. long, rather broad, narrowed toward the obtuse nearly entire apex, obscurely pubescent toward base or glabrous; anthers 0.8 to 1 mm. long.
Distribution: Salt-marshes and shores, Labrador to Connecticut; Alaska and British Columbia to Oregon.
Distribution in British Columbia: Along the coast.

5. *Puccinellia grandis* Swallen.

Habit: Perennial.
Culms: Densely tufted, 50 to 90 cm. tall.
Sheaths: Glabrous.

Blades: Firm, drying involute, 2 to 3.5 mm. wide.

Inflorescence: Pyramidal panicle, 10 to 20 cm. long, the scabrous branches finely spreading.

Spikelets: 8 to 15 mm. long, 5- to 12-flowered, appressed.

Lemmas: 3 to 4 mm. long, obtuse or subacute, sparsely pilose at the base; anthers 1.3 to 1.5 mm. long.

Ligules: 2 to 3 mm. long.

Distribution: Sea-beaches, Alaska, British Columbia, to central California.

Distribution in British Columbia: Victoria and Vancouver.

48. *Schizachne* Hack.

Rather tall perennial with simple culms and open rather few-flowered panicle. Spikelets several-flowered, disarticulating above the glumes and between the florets, the rachilla glabrous; glumes unequal, 3- and 5-nerved; lemmas lanceolate, strongly 7-nerved, long-pilose on the callus, awned from just below the teeth of the prominent bifid apex; palea with softly pubescent, thickened submarginal keels, the hairs longer toward the summit.

Schizachne purpurascens (Torr.) Swallen. False Melic

Schizachne striata (Michx.) Hult.

Melica striata (Michx.) Hitchc.

Habit: Perennial.

Culms: Erect, from a loosely tufted decumbent base, 50 to 100 cm. tall.

Sheaths: Closed.

Blades: Flat, narrowed at the base, 1 to 5 mm. wide.

Inflorescence: A panicle, about 10 cm. long, the branches single or in pairs, more or less drooping, bearing 1 or 2 spikelets.

Spikelets: 2 to 2.5 cm. long.

Glumes: Purplish, less than half as long as the spikelet.

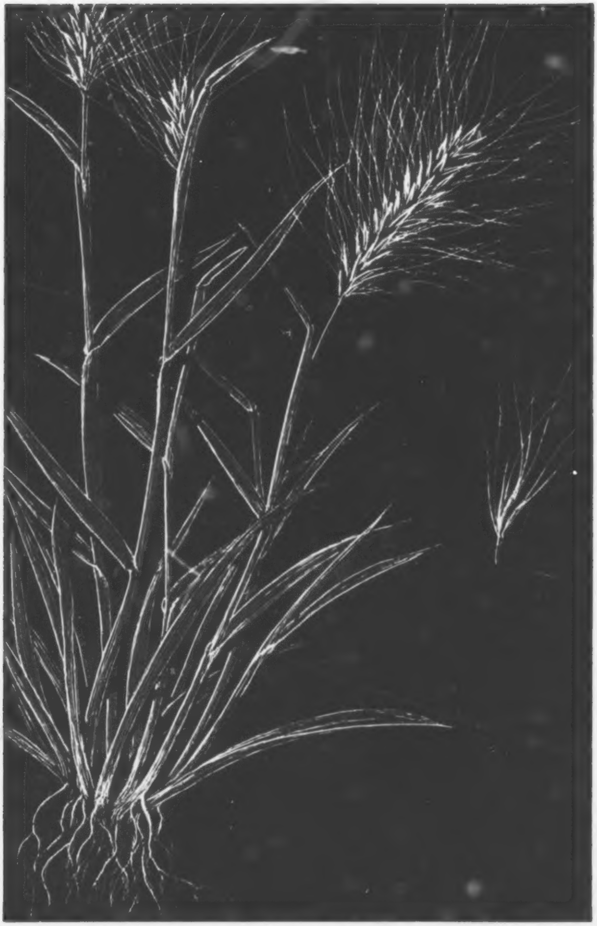
Lemmas: About 1 cm. long, the awn as long as the lemma or longer.

Distribution: Rocky woods, British Columbia to Newfoundland, south to Kentucky and Maryland.

Distribution in British Columbia: Field, Prince George, Fort St. James, and common northward.

49. *Scolochloa* Link.

Tall grasses, perennial from a thick rhizome, with flat elongate blades and widely spreading panicle. Spikelets large, 3- to 4-flowered, disarticulating above the glumes and between the lemmas.



Sitanion hystrix. Plant, ×⅓; spikelets, ×1.

Glumes unequal, thin, the first 3-nerved, the second 5-nerved, about equalling the lemma above it. Lemma lanceolate, acute, 7-nerved, very thin at the apex, densely villous on the callus. Palea thin, 2-toothed, finely ciliate, equalling the lemma.

***Scolochloa festucacea* (Willd.) Link. Sprangle-top**

Fluminea festucacea (Willd.) Hitchc.

Habit: Perennial with rhizomes.

Culms: Erect, stout, 1 to 1.5 m. tall, from extensively, creeping, succulent rhizomes.

Sheaths: Smooth.

Blades: Elongate, scabrous on the upper surface, mostly 5 to 10 mm. wide, extending into a fine point.

Inflorescence: A panicle 15 to 20 cm. long, loose, the distant branches fascicled, ascending, naked below, the lowermost nearly as long as the panicle.

Spikelets: About 8 mm. long, 3- to 5-flowered.

Glumes: Subequal, about 7 mm. long, thin, 5-nerved.

Lemmas: About 6 mm. long.

Distribution: Shallow water and marshes, Manitoba to British Columbia, south to northern Iowa, Nebraska, and eastern Oregon.

Distribution in British Columbia: Not common; Nicola, Lac la Hache, Vanderhoof, and Dog Creek.

50. *Secale* L. Rye

Erect, mostly annual grasses, with flat blades and dense spikes. Spikelets usually 2-flowered, solitary, placed flatwise against the rachis, the rachilla disarticulating above the glumes and produced beyond the upper floret as a minute stipe; glumes narrow, rigid, acuminate or subulate-pointed; lemmas broader, sharply keeled, 5-nerved, ciliate on the keel and exposed margins, tapering into a long awn.

***Secale cereale* L. Rye**

Habit: Annual or winter annual.

Culms: 1 to 2 m. tall, erect, usually glaucous, glabrous, or pubescent below the spike.

Blades: 6 to 13 mm. wide, scabrous, flat.

Inflorescence: A spike, 10 to 15 cm. long, dense, more slender than wheat, nodding, rachis internodes pubescent on the edges.

Spikelets: Usually 2-flowered, or a third rudimentary floret above.

Glumes: Narrow, rigid, awn-pointed, 1-nerved, scabrous on the keel, with one edge toward the rachis.

Lemmas: 5-nerved, sharply keeled, ciliate on the keels and exposed margins, tapering into a long awn.

Distribution: Commonly cultivated; escaped from cultivation, in fields and waste places.

Remarks: This species is thought to be derived from *S. montanum* Guss., a perennial native in the mountains of south-western Asia.

51. *Setaria* Beauv. Bristlegrass

Annuals, in ours, with flat blades, hairy ligules, and narrow, dense, spike-like, bristly panicles, the bristles representing involucres which are persistent and subtend the awnless spikelets. First glume short; second glume and sterile lemma subequal, several-nerved; fertile lemma indurate and finely rugose at maturity. Articulation below the glumes. Weeds of cultivated areas.

KEY TO THE SPECIES OF SETARIA

Spikelets 3 mm. long; bristles 5 to 8, yellowish brown, 5 to 8 mm. long .... 1. *S. lutescens*

Spikelets 2 mm. long; bristles 3, green or purplish, 6 to 12 mm. long .... 2. *S. viridis*

1. *Setaria lutescens* (Weigel) Hubb. Yellow Foxtail

Setaria Glauca (L.) Beauv.

Habit: Annual.

Culms: Erect to prostrate, mostly 50 to 100 cm. tall, compressed.

Sheaths: Keeled.

Blades: As much as 25 cm. long and 1 cm. wide, flat, twisted in a loose spiral, villous toward the base above.

Inflorescence: A dense panicle, evenly cylindric, spike-like, yellow at maturity, mostly 5 to 10 cm. long, about 1 cm. thick, the axis densely pubescent; bristles 5 to 20 in a cluster, the longer 2 to 3 times as long as the spikelet.

Spikelets: 3 mm. long.

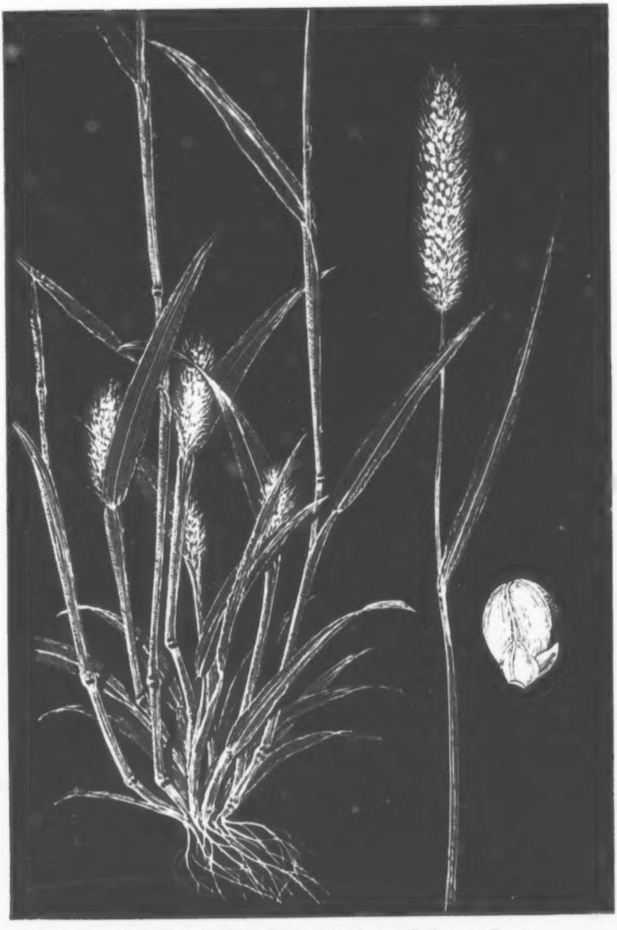
Lemmas: Fertile, finely and sharply cross-wrinkled.

Fruit: Strongly rugose.

Distribution: Cultivated soil and waste places, New Brunswick to North Dakota, south to Florida and Texas, occasionally to British Columbia and California.

Distribution in British Columbia: Still a rather uncommon plant; Duncan, Agassiz, and Osoyoos.

Remarks: Introduced from Europe.



Setaria viridis. Plant, ×⅓; spikelet, ×5.

2. *Setaria viridis* (L.) Beauv. Green Bristlegrass

Habit: Annual.
Culms: Branching at base, sometimes geniculate-spreading, 20 to 40 cm. tall.
Sheaths: Compressed, smooth or scabrous.
Blades: Flat, usually less than 15 cm. long and 1 cm. wide.
Inflorescence: An erect or somewhat nodding panicle, densely flowered, green or purple, cylindric or tapering a little at the summit, usually less than 10 cm. long.
Spikelets: 2 to 2.5 mm. long; bristles 1 to 3 below each spikelet, mostly 3 to 4 times the length.
Lemmas: Fertile lemma minutely cross-wrinkled; fruit very finely rugose.
Distribution: A weed in cultivated soil and waste places, common throughout the United States, and from British Columbia to Newfoundland.
Distribution in British Columbia: Has become a widely distributed weed, especially in the Okanagan.
Remarks: Introduced from Europe.

52. *Sitanion.* Squirrel-tail

Cæspitose perennials, with spike-like panicles, which readily break up into segments; spikelets, 2 to 3 at each joint of the rachis, rarely solitary, 1- to 5-flowered; glumes subulate and entire, or lanceolate and bifid, or parted into several long-awned lobes; lemmas 5-nerved, lanceolate and acute, or those of the lowest floret sterile and subulate, entire with a single awn, or trifid and 3-awned; palea 2-keeled.

Sitanion hystrix (Nutt.) J. G. Smith

Habit: Perennial.
Culms: Erect to spreading, rather stiff, 10 to 50 cm. tall.
Sheaths: Glabrous to closely pubescent.
Blades: Flat to involute, rather stiffly ascending to spreading, 5 to 20 cm. long, 1 to 3 mm. wide.
Inflorescence: A spike, mostly short-exserted or partly included, erect, 2 to 7 cm. long.
Glumes: Very narrow, 1- to 2-nerved, the nerves extending into scabrous awns, sometimes bifid to the middle, or bearing a bristle or awn along 1 margin.
Lemmas: Convex, smooth or scabrous to appressed pubescent, sometimes glaucous, the awns of glumes and lemmas widely spreading, 2 to 10 cm. long.

Distribution: Dry hills and plains, open woods, and rocky slopes, British Columbia to South Dakota, south to Texas and California.
Distribution in British Columbia: Widely distributed but not abundant.

53. *Spartina* Schreb. Cordgrass

Coarse perennial grasses with strong creeping rootstocks, rigid simple stems and long tough leaves; inflorescence of one-sided spreading or erect alternate spikes; spikelets 1-flowered, narrow, deciduous, borne in two rows on the rachis, articulated with the very short pedicels below the glumes; glumes keeled, very unequal; lemma keeled, equalling or shorter than the second glume; palea often longer than its lemma; grain free.

KEY TO THE SPECIES OF SPARTINA

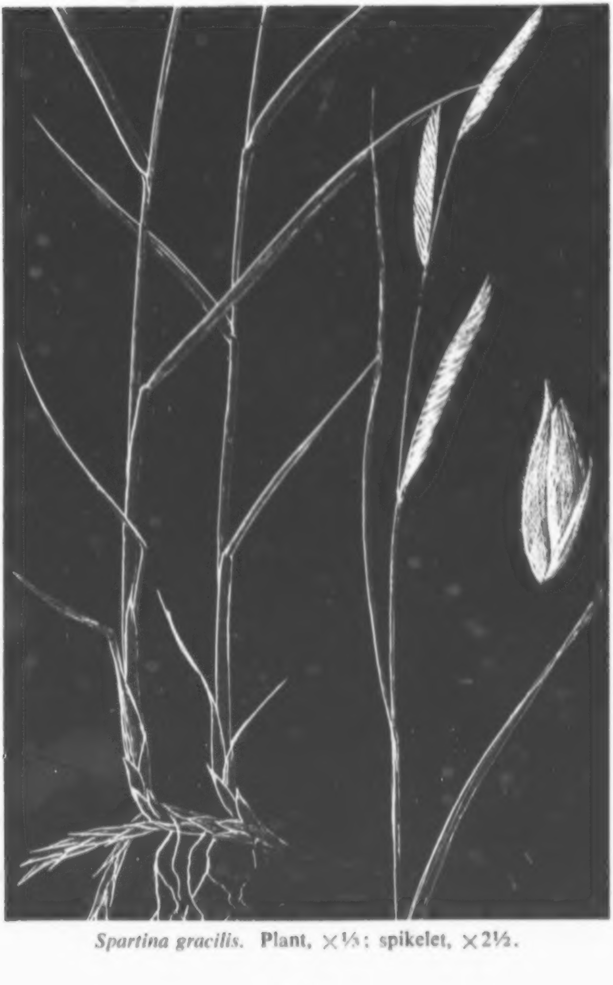
Blades usually more than 5 mm. wide; plants mostly robust and more than 1 m. tall .... 1. *S. pectinata*
Blades less than 5 mm. wide; plants slender and less than 1 m. tall .... 2. *S. gracilis*

1. *Spartina pectinata* Link. Prairie Cordgrass

Spartina michauxiana Hitchc.
Habit: Perennial.
Culms: 1 to 2 m. tall, firm or wiry.
Blades: Elongate, flat when fresh, soon involute in drying; as much as 1.5 cm. wide, very scabrous on the margins.
Inflorescence: Spikes mostly 10 to 20, sometimes fewer or as many as 30, mostly 4 to 8 cm. long, ascending, sometimes appressed, rarely spreading, on rather slender peduncles.
Glumes: Hispid-scabrous on the keel, the first acuminate or short-awned, nearly as long as the floret, the second exceeding the floret, tapering into an awn as much as 7 mm. long.
Lemmas: Glabrous, except the scabrous keel, 7 to 9 mm. long, the apex with 2 rounded teeth; palea usually a little longer than the lemma.
Distribution: Newfoundland to eastern Washington and along the eastern coast.
Distribution in British Columbia: The only recorded British Columbia specimen was collected on the shore of Sea Island.

2. *Spartina gracilis* Trin. Alkali Cordgrass

Habit: Perennial.
Culms: 60 to 120 cm. tall.
Sheaths: Smooth.



Spartina gracilis. Plant, ×⅓; spikelet, ×2½.

Blades: Flat, becoming involute, 15 to 20 cm. long, very scabrous above, mostly less than 5 mm. wide.
Inflorescence: Spikes 4 to 8, closely appressed, 2 to 4 cm. long.
Spikelets: 6 to 8 mm. long.
Glumes: Ciliate on the keel, acute, the first about half as long as the second.
Lemmas: Nearly as long as second glume, ciliate on the keel; palea as long as lemma, obtuse.
Distribution: Alkaline meadows and plains, British Columbia to Saskatchewan, south to Washington and Kansas.
Distribution in British Columbia: Cariboo, Cranbrook, Ashcroft, and Windermere.

54. *Sphenopholis* Scribn. Wedgegrass

Slender perennials (rarely annual) with usually flat blades and narrow shining panicles. Spikelets 2- or 3-flowered, the pedicel disarticulating below the glumes, the rachilla produced beyond the upper floret as a slender bristle; glumes unlike in shape, the first narrow, usually acute, 1-nerved, the second broadly ovate, 3- to 5-nerved, the nerves sometimes obscure, mostly somewhat coriaceous, the margin scarious; lemmas firm, scarcely nerved, awnless or rarely with an awn from just below the apex, the first a little shorter or a little longer than the second glume; palea hyaline, exposed.

Key to the Species of Sphenopholis

Panicle dense, usually spike-like, erect or nearly so; second glume subcucullate .... 1. *S. obtusata*
Panicle not dense, lax, nodding, from very slender to many-flowered, but not spike-like .... 2. *S. intermedia*

1. *Sphenopholis obtusata* (Michx.) Scribn. Prairie Wedgegrass

Habit: Perennial, sometimes annual or flowering the first season.
Culms: Erect, tufted, 30 to 100 cm. tall.
Sheaths: Glabrous to finely retrorsely pubescent.
Blades: Flat, glabrous, scabrous, or pubescent, mostly 2 to 5 mm. wide.
Inflorescence: A panicle, erect or nearly so, dense, spike-like to interrupted or lobed, rarely slightly loose, 5 to 20 cm. long.
Spikelets: 2.5 to 3.5 mm. long, the two florets close together; second glume very broad, somewhat inflated at maturity, 5-nerved, scabrous.
Lemmas: Minutely papillose, rarely mucronate or with a short straight awn, the first about 2.5 mm. long.

Distribution: Open woods, old fields, moist ground, the prairies, Maine to British Columbia, south to Florida, Arizona, and California.
Distribution in British Columbia: Fairmont Hot Springs and Kootenay Lake.

2. *Sphenopholis intermedia* (Rydb.) Rydb. Slender Wedgegrass

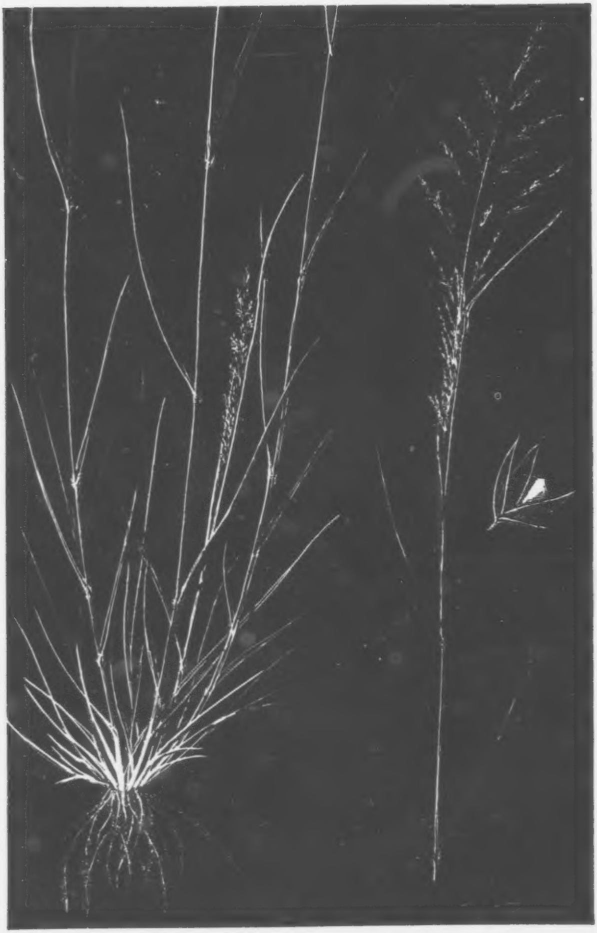
Sphenopholis pallens (Spreng.) Scribn.
Habit: Perennial.
Culms: Erect, in small tufts, 30 to 120 cm. tall.
Sheaths: Glabrous or pubescent.
Blades: Flat, often elongate, lax, mostly 2 to 6 mm. wide, sometimes wider, mostly scaberulous, occasionally sparsely pillose.
Inflorescence: A nodding panicle, from rather dense to open, mostly 10 to 20 cm. long, the branches spikelet-bearing from the base.
Spikelets: 3 to 4 mm. long.
Glumes: Second glume relatively thin, acute or subacute, about 2.5 mm. long.
Lemmas: Subacute, rarely mucronate, smooth or rarely very minutely roughened, mostly 2.5 to 3 mm. long.
Distribution: Damp or rocky woods, slopes and moist places, Newfoundland to British Columbia, south to Florida and Arizona.
Distribution in British Columbia: Canal Flats.

55. *Sporobolus* R. Br. Dropseed

Annuals or perennials, with small spikelets in open or contracted panicles. Spikelets 1-flowered, the rachilla disarticulating above the glumes; glumes 1-nerved, usually unequal, the second often as long as the spikelet; lemma membranaceous, 1-nerved, awnless; palea usually prominent and as long as the lemma or longer; caryopsis free from the lemma and palea, falling readily from the spikelet at maturity, the pericarp free from the seed, usually thin and closely enveloping it, but readily slipping away when moist.

Sporobolus cryptandrus (Torr.) A. Gray. Sand Dropseed

Habit: Perennial.
Culms: Erect or spreading, sometimes prostrate, 30 to 100 cm. tall, usually in rather small tufts.
Sheaths: With a conspicuous tuft of long white hairs at the summit.
Blades: Flat, 2 to 5 mm. wide, more or less involute in drying, tapering to a fine point.



Sporobolus cryptandrus. Plant, ×⅓; spikelet, ×5.

Inflorescence: Panicles, terminal and auxiliary, usually included at the base, sometimes entirely included, the well-developed terminal panicles open, as much as 25 cm. long, the branches spreading or sometimes reflexed, rather distant, naked at base, as much as 8 cm. long or even more, the spikelets crowded along the upper part of the main branches.

Spikelets: From pale to leaden, 2 to 2.5 mm. long.

Glumes: First glume one-third to half as long, the second about as long as the acute lemma and palea.

Distribution: Sandy open ground, Ontario to British Columbia, and over most of the United States with the exception of the extreme south-east.

Distribution in British Columbia: Widely distributed in the southern dry belt, extending at least as far north as Redstone.

Remarks: The seed of this species has been used for food by the Indians.

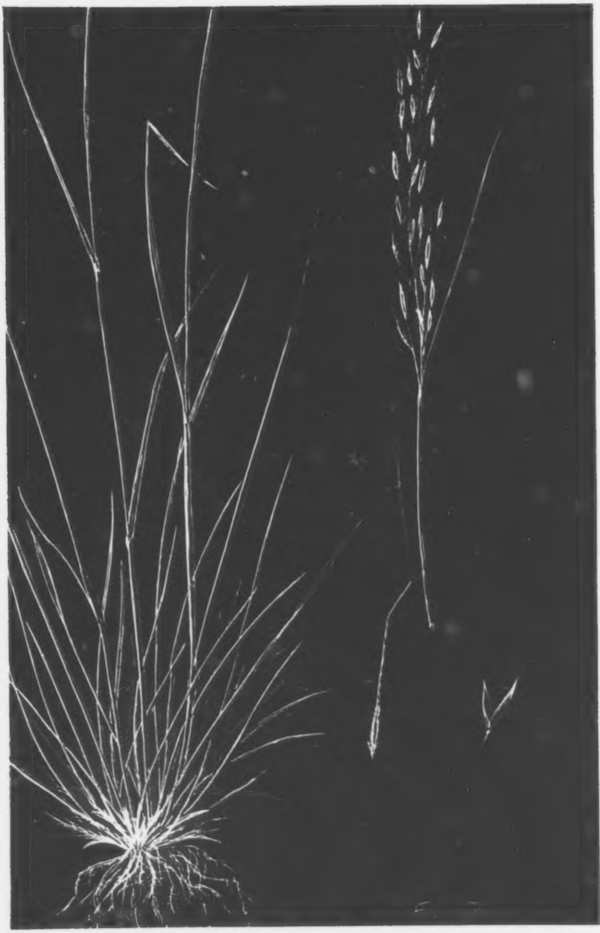
56. *Stipa* L. Needlegrass

Tufted perennials, with usually convolute blades and mostly narrow panicles. Spikelets 1-flowered, disarticulating above the glumes, the articulation oblique, leaving a bearded, sharp-pointed callus attached to the base of the floret; glumes membranaceous, often papery, acute, acuminate, or even aristate, usually long and narrow; lemma narrow, terete, firm or indurate, strongly convolute, rarely the margins only meeting, terminating in a prominent awn, the junction of body and awn evident, the awn twisted below, geniculate, usually persistent; palea enclosed in the convolute lemma.

The species are for the most part valuable forage plants.

KEY TO THE SPECIES OF STIPA

Awn plumose below, the hairs ascending or spreading.
  Hairs on upper part of lemma longer than those below; culms 60 to 120 cm. tall .... 1. *S. elmeri*
  Hairs short all over the lemma; culms 25 to 40 cm. tall .. 2. *S. occidentalis*
Awn scabrous or nearly glabrous, not plumose.
  Lemma more than 7 mm. long, glabrous or sparsely pubescent above the callus, mostly cylindric.
    Mature lemma pale or finely brownish, sparsely pubescent to summit .... 3. *S. comata*
    Mature lemma dark .... 4. *S. spartea*
  Lemma less than 7 mm. long, distinctly pubescent on the upper part.
    Panicle open, the branches spreading or ascending .... 5. *S. richardsoni*
    Panicle narrow, branches appressed.
      Glumes broad, abruptly acuminate, the first 5-nerved .... 6. *S. lemmoni*



Stipa columbiana. Plant, × ⅓; glumes and floret, × 1.

Glumes narrow, gradually acuminate, the first usually 3-nerved.
  Sheaths, at least the lowermost, pubescent .... 7. *S. williamsii*
  Sheaths glabrous.
    Sheaths villose at the throat; fruit rather turgid, the callus broad and short .... 8. *S. viridula*
    Sheaths not villose at the throat; fruits slender, the callus narrow, sharp-pointed .... 9. *S. columbiana*

1. *Stipa elmeri* Piper and Brodie ex Scribn.

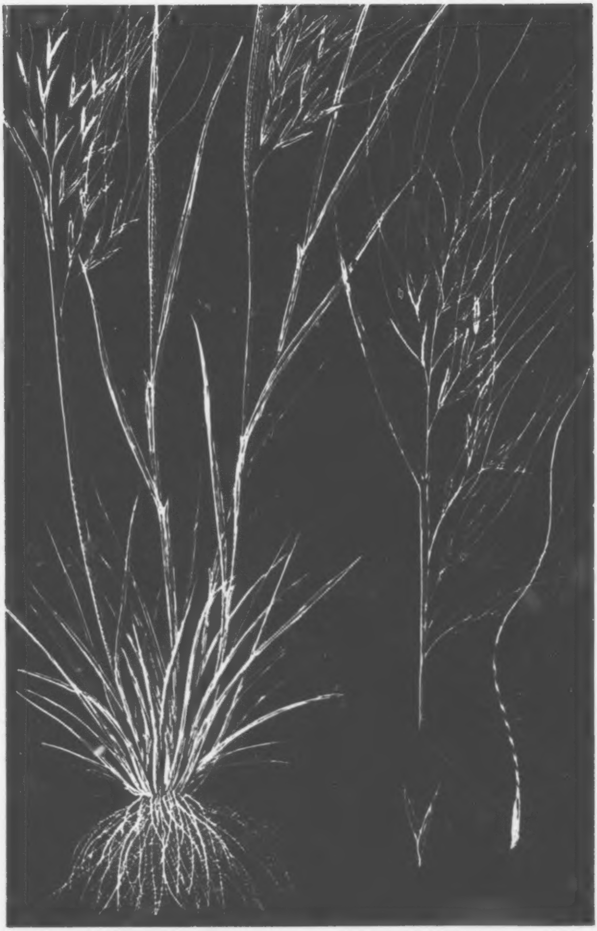
Habit: Perennial.
Culms: 60 to 100 cm. tall, more or less puberulent, especially at the nodes.
Sheaths: Pubescent.
Blades: 15 to 30 cm. long, 2 to 4 mm. wide, flat or becoming involute, pubescent on the upper surface, or those of the innovations also on the lower surface.
Inflorescence: A narrow panicle, 15 to 35 cm. long, rather loose.
Glumes: 12 to 14 mm. long, long-acuminate, hyaline except toward base.
Lemmas: About 7 mm. long, appressed-pubescent, the callus 1 mm. long; awn 4 to 5 cm. long, distinctly twice-geniculate, the segments nearly equal, the first and second finely plumose.
Ligule: Very short.
Distribution: Dry hills, sandy plains, and open woods, British Columbia to California.
Distribution in British Columbia: Collected only from Midway.

2. *Stipa occidentalis* Thurb. Western Needlegrass

Habit: Perennial.
Culms: Mostly 25 to 40 cm. tall.
Sheaths: Glabrous to pubescent.
Blades: 10 to 20 cm. long, 1 to 2 mm. wide, usually involute, glabrous beneath, white-puberulent on the upper surface.
Inflorescence: A panicle 10 to 20 cm. long, lax, the few slender branches narrowly ascending.
Glumes: About 12 mm. long, the attenuate tips hyaline.
Lemmas: Pale brown, about 7 mm. long, rather sparsely appressed-pubescent; awn 3 to 4 cm. long, twice-geniculate, plumose, the hairs on first and second segments about 1 mm. long, shorter on the third segment.
Ligule: Very short.
Distribution: Plains, rocky hills, and open woods, British Columbia to Wyoming and California.
Distribution in British Columbia: Summerland, Trail, and Manning Park.

3. *Stipa comata* Trin. and Rupr. Needle-and-thread, Speargrass

Habit: Perennial.
Culms: 30 to 60 cm. tall, sometimes taller.



Stipa comata. Plant, ×⅓; glumes and floret, ×1.

Sheaths: Glabrous.

Blades: 10 to 30 cm. long, 1 to 2 mm. wide, flat or involute.

Inflorescence: A panicle, commonly included at base, narrow, 10 to 20 cm. long.

Glumes: 1.5 to 2 cm. long, the attenuate tips subhyaline.

Lemmas: 8 to 12 mm. long, mostly about 1 cm., pale or finally brownish, the callus about 3 mm. long, the body sparsely pubescent or glabrate toward the summit; awn 10 to 15 cm. long, indistinctly twice-geniculate, very slender, loosely twisted below, flexuous above, often deciduous.

Ligule: Thin, 3 to 4 mm. long.

Distribution: Prairies, plains, and dry hills, over most of Canada and the United States.

Distribution in British Columbia: Dry interior; Lac la Hache, Newgate, and Oliver.

4. *Stipa spartea* Trin. Porcupine Grass

Habit: Perennial.

Culms: About 1 m. tall.

Blades: 20 to 30 cm. long, 3 to 5 mm. wide, flat, involute, and drying.

Inflorescence: A panicle 15 to 20 cm. long, narrow, nodding, the few slender branches bearing 1 to 2 spikelets.

Glumes: 3 to 4 cm. long.

Lemmas: Subcylindric, brown, 1.5 to 2.5 cm. long, the callus about 7 mm. long, the body pubescent below, glabrous above except for a line of pubescence on one side, the crown erect-ciliate; awn stout, 12 to 20 cm. long, twice-geniculate.

Ligule: Rather firm, 4 to 5 mm. long.

Distribution: Prairies, Ontario to British Columbia, Pennsylvania to New Mexico.

Distribution in British Columbia: Hitchcock lists it as occurring in British Columbia, but to date all collections are the variety *curtiseta*.

Note: *S. spartea* var. *curtiseta* Hitchc. This variety occurs from Manitoba to British Columbia, and from South Dakota to Wyoming, and is the common form in British Columbia. The differences between *S. spartea* and the variety *curtiseta* are as follows: Glumes 2 to 3 cm. long, lemma 12 to 15 cm. long, awn mostly not more than 7 or 8 cm. long.

5. *Stipa richardsoni* Link. Richardson Needlegrass

Habit: Perennial.

Culms: 50 to 100 cm. tall.

Blades: Mostly basal, usually 15 to 25 cm. long, involute, subfiliform, scabrous.

Inflorescence: A panicle 10 to 20 cm. long, open, the branches slender, distant, spreading or drooping, naked below.

Glumes: 8 to 9 mm. long.

Lemmas: About 5 mm. long, subfusiform, brown at maturity; awn 2.5 to 3 cm. long.

Distribution: Bottom-lands and wooded slopes, Saskatchewan to British Columbia, South Dakota to Colorado.

Distribution in British Columbia: Widely distributed in the interior and as far north as Francois Lake.

6. *Stipa lemmoni* (Vasey) Scribn. Lemmon Needlegrass

Habit: Perennial.

Culms: 30 to 80 cm. tall, scaberulous, usually puberulent below the nodes.

Sheaths: Nearly smooth.

Blades: 10 to 20 cm. long, flat or involute, 1 to 2 mm. wide, or those of the innovations very narrow.

Inflorescence: A panicle, 5 to 12 cm. long, narrow, pale or purplish.

Glumes: 8 to 10 mm. long, rather broad and firm, somewhat abruptly acuminate, the first 5-nerved, the second 3-nerved.

Lemmas: 6 to 7 mm. long, pale or light brown, the callus rather blunt, the body fusiform, 1.2 mm. wide, villose with appressed hairs; awn 20 to 35 mm. long, twice-geniculate, appressed-pubescent to the second bend.

Ligule: 1 to 3 mm. long.

Distribution: Dry open ground and open woods, British Columbia to Idaho and California.

Distribution in British Columbia: Collected from Comox Sandspit by Macoun.

7. *Stipa williamsii* Scribn. Williams Needlegrass

Habit: Perennial.

Culms: 40 to 100 cm. tall.

Sheaths: More or less pubescent.

Blades: The lower blades at least, pubescent on both surfaces, 1 to 2.5 mm. wide, stiff and involute.

Inflorescence: A panicle 10 to 20 cm. long.

Glumes: Narrow, thin, 8 to 10 mm. long.

Lemmas: About 7 mm. long; awn usually 3 to 5 cm. long.

Distribution: Dry hills and plains, Montana to British Columbia, south to Colorado and California.

Distribution in British Columbia: Quite widely distributed; Trail, Elko, Cranbrook, Lac la Hache, Manning Park, and Monte Creek.

8. *Stipa viridula* Trin. Green Needlegrass

Habit: Perennial.

Culms: 60 to 100 cm. tall.

Sheaths: Villose at the throat, often sparingly so, more or less hispidulous in a line across the collar.

Blades: 10 to 30 cm. long, 1 to 5 mm. wide, flat or, especially on the innovations, involute.

Inflorescence: A panicle, 10 to 20 cm. long, narrow, rather closely flowered, greenish or tawny at maturity.

Glumes: 7 to 10 mm. long, hyaline-attenuate.

Lemmas: 5 to 6 mm. long, fusiform, at maturity plump, more than 1 mm. wide, the body at maturity brownish, appressed-pubescent, the callus rather blunt; awn 2 to 3 cm. long, twice-geniculate.

Ligule: About 1 mm. long.

Distribution: Plains and dry slopes, British Columbia to Saskatchewan, south to Arizona and Wisconsin.

Distribution in British Columbia: Not common; Columbia Valley, Victoria, and Kamloops.

9. *Stipa columbiana* Macoun. Columbia Needlegrass

Habit: Perennial.

Culms: Mostly 30 to 60 cm. tall, sometimes as much as 1 m.

Sheaths: Naked at the throat.

Blades: 10 to 25 cm. long, 1 to 3 mm. wide, mostly involute, especially on the innovations, those of the culms sometimes flat.

Inflorescence: A panicle, 7 to 20 cm. long, narrow, mostly rather dense, often purplish.

Glumes: About 1 cm. long.

Lemmas: 6 to 7 mm. long, pubescent as in *S. viridula,* the body narrow, the callus sharper; awn 2 to 2.5 cm. long, twice-geniculate.

Distribution: Dry plains, meadows, and open woods, British Columbia to California and east to South Dakota.

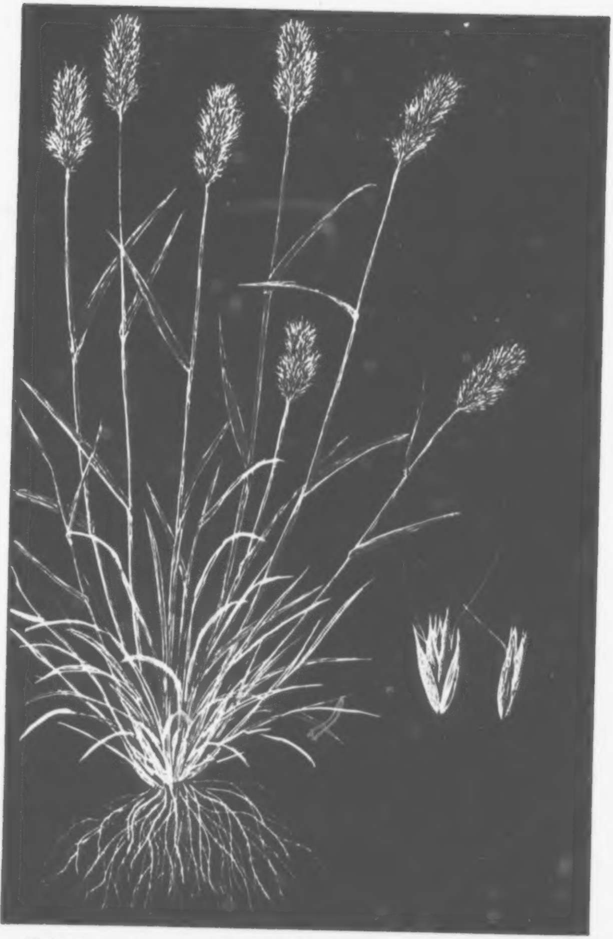
Distribution in British Columbia: Widely distributed in the interior ranging as far north as the Yukon.

Note: Differing from *S. viridula* in the glabrous throat of the sheaths and in the shape of the fruit.

57. *Trisetum* Pers. Trisetum

Tufted perennials, with flat blades and open or usually contracted or spike-like shining panicles. Spikelets usually 2-flowered, sometimes 3- to 5-flowered, the rachilla prolonged behind the upper floret, usually villous; glumes somewhat unequal, acute, the second usually longer than the first floret; lemmas usually short-bearded at base, 2-toothed at apex, the teeth often awned, bearing from the back below the cleft apex a usually bent and exserted awn.

Several of the species are valuable for grazing. *Trisetum spicatum* constitutes an important part of the forage on alpine and subalpine slopes.



Trisetum spicatum. Plant, ×⅓; spikelet and floret, ×2½.

KEY TO THE SPECIES OF TRISETUM

Panicle dense, spike-like, sometimes slightly interrupted below; plants densely tufted .... 1. *T. spicatum*

Panicle loose and open to contracted, but not spike-like; plants in small tufts or solitary.

Panicle relatively few-flowered, loose, lax or drooping, the filiform branches naked below; florets distant .... 2. *T. cernuum*

Panicle many-flowered, from rather loose to dense and interrupted; florets not distant.

Panicle yellowish; spikelets mostly 3- to 4-flowered; introduced .... 3. *T. flavescens*

Panicle pale green, sometimes purplish tinged; spikelets usually 2-flowered .... 4. *T. canescens*

1. *Trisetum spicatum* (L.) Richt. Spike Trisetum

Habit: Perennial.

Culms: Densely tufted, erect, 15 to 50 cm. tall, glabrous to puberulent.

Sheaths: Puberulent.

Blades: Puberulent.

Inflorescence: A dense panicle, usually spike-like, often interrupted at base, pale or often dark purple, 5 to 15 cm. long.

Spikelets: 4 to 6 mm. long.

Glumes: Somewhat unequal in length, glabrous or scabrous except the keels, or sometimes pillose, the first narrow, acuminate, 1-nerved, the second broader, acute, 3-nerved; lemmas scaberulous, 5 mm. long, the first longer than the glumes, the teeth setaceous; awn attached about one-third below the tip, 5 to 6 mm. long, geniculate, exserted.

Distribution: Alpine meadows and slopes, from the Arctic south to Connecticut, New Mexico, and California.

Distribution in British Columbia: Alpine or subalpine in the south, descending to cultivated levels farther north.

Remarks: This species is very variable, but one of the more outstanding varieties which intergrades with the species is *T. spicatum* var. *molle* (Michx.) Beal. Foliage is densely pubescent. Less common than the type.

2. *Trisetum cernuum* Trin. Nodding Trisetum

Habit: Tufted perennial.

Culms: Rather lax, 60 to 120 cm. tall.

Sheaths: Glabrous to sparsely pillose.

Blades: Thin, flat, lax, scabrous, 6 to 12 mm. wide.

Inflorescence: An open, lax, drooping panicle, 15 to 30 cm. long, the branches verticillate, filiform, flexuous, spikelet-bearing toward the ends.

Spikelets: 6 to 12 mm. long, with usually 3 distant florets, the first longer than the second glume.

Glumes: First glume narrow, acuminate, 1-nerved, 0.5 to 2 mm. long, the second broad, 3-nerved, 3 to 4 mm. long, occasionally reduced.

Lemmas: 5 to 6 mm. long, the teeth setaceous, the hairs of the callus 0.5 to 1 mm. long, of the rachilla as much as 2 mm. long, the awns slender, curved, flexuous or loosely spiral, mostly 5 to 10 mm. long, attached 1 to 2 mm. below tip.

Distribution: Moist woods, Alberta, British Columbia, south to western Montana and northern California.

Distribution in British Columbia: Widely distributed at the coast and in the interior.

3. *Trisetum flavescens* (L.) Beauv.

Habit: Perennial.

Culms: Erect or decumbent at base, 60 to 120 cm. tall.

Sheaths: Glabrous or the lower sparsely pilose.

Blades: Flat, scabrous or canescent, mostly 2 to 7 mm. wide.

Inflorescence: Panicle, usually yellowish, many-flowered, somewhat condensed.

Spikelets: Mostly 3- or 4-flowered.

Glumes: Smooth except the keel, the first narrow, acuminate, the second broad, acute, 3-nerved, 5 to 7 mm. long.

Lemmas: 4 to 6 mm. long.

Distribution: Waste places; British Columbia, Vermont, and south to California.

Remarks: Introduced from Europe as a forage plant and occasionally escaping.

4. *Trisetum canescens* Buckl. Tall Trisetum

Habit: Perennial.

Culms: Erect or decumbent at base, 60 to 120 cm. tall.

Sheaths: At least the lower, sparsely to densely pilose, rarely scabrous only.

Blades: Flat, scabrous or canescent, sometimes sparsely pilose, mostly 2 to 7 mm. wide.

Inflorescence: A narrow panicle, usually loose, sometimes interrupted and spike-like, 10 to 25 cm. long.

Spikelets: About 8 mm. long, 2- or 3-flowered, the florets not so distant as in *T. cernuum*.

Glumes: Smooth except the keel, the first narrow, acuminate, the second broad, acute, 3-nerved, 5 to 7 mm. long.

Lemmas: Rather firm, scaberulous, the upper exceeding the glumes, 5 to 6 mm. long, the teeth aristate, the callus hairs rather scant, the rachilla hairs copious; awn geniculate, spreading, loosely twisted below, attached one-third below the tip, usually about 12 mm. long.

Distribution: Mountain meadows and along streams, Montana to British Columbia, south to central California.

Distribution in British Columbia: Widely distributed both at the coast and in the interior.

58. *Triticum* L. Wheat

Low or rather tall annuals, with flat blades and thick spikes. Spikelets 2- to 5-flowered, solitary, placed flatwise at each joint of a continuous or articulate rachis, the rachilla disarticulating above the glumes and between the florets or continuous; glumes rigid, keeled, 3- to several-nerved, the apex abruptly mucronate or toothed or with one to several awns; lemmas broad, keeled, very asymmetric, many-nerved, abruptly pointed or awned.

Triticum æstivum L. Wheat

Habit: Annual or winter annual.

Culms: Erect, freely branching at the base, 60 to 100 cm. tall.

Sheaths: Smooth to slightly scabrous or pubescent.

Blades: 1 to 2 cm. wide.

Inflorescence: A spike, mostly 5 to 12 cm. long; internodes of rachis 3 to 6 mm. long.

Spikelets: Broad, glabrous or pubescent, long-awned to awnless.

Glumes: Usually strongly keeled toward one side, the keel extending into a mucro, the other side usually obtusely angled at apex.

Lemmas: Broad, keeled.

Distribution: Commonly cultivated; fields and waste places in the vicinity of fields or grain-elevators, but not established.

Remarks: A large number of varieties are in cultivation; the lemmas may be glabrous or pubescent, the awns long or nearly or quite wanting. The origin of wheat is not known, as there is no native species like any of the cultivated forms. Stories of varieties originating from seed found with mummies 3,000 years old have no basis in fact.

59. *Zea* L. Corn

Robust annual, with terminal panicles (tassels) of staminate racemes, and short-peduncled, pistillate, 8- to many-rowed spikes (ears) enclosed in numerous spaths (husks). Spikelets unisexual; staminate spikelets 2-flowered, in pairs, on one side of a continuous rachis, one nearly sessile, the other pedicellate; glumes membranaceous, acute; lemma and palea hyaline; pistillate spikelets sessile, in pairs, consisting of 1 fertile floret and 1 sterile floret, the latter sometimes developed as a second fertile floret; glumes broad, rounded or emarginate at apex; sterile and fertile lemmas hyaline, the palea developed; style very long and slender, stigmatic along both sides well toward the base.

Zea mays L. Maize, Indian Corn

Habit: Tall robust monœcious annual.

Culms: Simple or branched, stout 1 to 6 m. high.

Blades: Broad, channelled, 2 to 5 cm. wide, 2-ranked, crinkled-edged.

Sheaths: Overlapping.

Inflorescence: Unisexual, monœcious; terminal panicle of several spike-like racemes (tassels) of staminate flowers, racemes mostly 15 to 25 cm. long, the central one usually longest. Pistillate inflorescence in the axils of the leaves, the spikelets in 8 to 16 (or more) rows on a thickened, almost woody axis (cob), the whole enclosed in numerous large leaf-like bracts or spathes (husks), the long styles (silk) protruding from the summit as a mass of silky threads. Grains or kernels at maturity greatly exceeding the glumes.

Remarks: Maize or Indian corn is one of the important economic plants of the world, being cultivated for food for man and domestic animals and for forage. It originated in America, probably on the Mexican plateau, and was cultivated from prehistoric times by the early races of American aborigines, from Peru to middle North America.

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EXCLUDED SPECIES

This list includes those grasses which are of doubtful occurrence due to improper identification. It also includes those plants which for one reason or another have not established themselves.

Agrostis longiligula Hitchc. Listed in the Provincial Museum Catalogue, 1921, as occurring on Vancouver Island.

Alopecurus howellii Vasey. Listed in Macoun's Additions to the Flora of Vancouver Island, 1913, as occurring at Ucluelet Inlet.

Arctagrostis latifolia (R. Br.) Griseb. Collected at Metah Mountain, British Columbia.

Eragrostis hypnoides (Lam.) B. S. P. Credited to British Columbia by Rydberg but not by Hitchcock.

Mibora minima (L.) Desv. (*M. verna* Beauv.). Collected by Macoun at the Dominion Experimental Station, Saanichton, V.I., in 1914. Not reported since.

Panicum huachucæ Ashe var. *fasciculatum* (Torr.) F. T. Hubb. Collected at Agassiz and Sicamous by M. O. Malte.

Panicum tenue Muhl. Listed in the Provincial Museum Catalogue, 1921, as occurring in the Renfrew district.

Puccinellia maritima Wahl. Found by Anderson in 1896 at Clayoquot and Victoria Arm, British Columbia.

Setaria verticillata (L.) Beauv. Found in a garden at Kamloops in 1933.

GLOSSARY

Abortive—imperfectly developed or not developed.

Acuminate—gradually tapering to a point.

Acute—sharp-pointed, but less tapering than acuminate.

Alternate—a single leaf or scale at a node.

Annual—applied to grasses which do not live more than one year.

Anther—the part of the stamen which contains the pollen.

Anthesis—when the flower is open; in grasses, when the lemma and palea are expanded and the anthers and stigmas are mature.

Antrose—directed upwards or forwards.

Appressed—lying against an organ; e.g., hairs appressed to the stem.

Articulate—jointed; joined by a line of demarcation between two parts which at maturity separate by a clean-cut scar.

Articulation—the point of union of two articulate organs.

Ascending—sloping upward.

Attenuate—gradually narrowed to a slender apex or base.

Auricle—an ear; applied to ear-like lobes at the base of the blades.

Awn—a slender bristle; in grasses the awn is usually a continuation of the midnerve of the glumes or lemmas.

Axil—the angle between a leaf and a stem.

Axillary—growing in an axil.
Axis—the main stem of an inflorescence, especially of a panicle.
Barbed—furnished with backwardly pointed projections.
Beak—a hard point or projection.
Bearded—with long or stiff hairs.
Biennial—of two year's continuance.
Bifid—two-cleft or two-lobed.
Blade—the part of the leaf above the sheath.
Bract—the reduced leaves of the inflorescence and upper part of a shoot.
Bristly—a stiff, slender appendage, likened to a hog's bristle; an awn is a kind of bristle.
Bulbous—swollen at the base like a bulb or corm.
Callus—the hardened downward extension of the mature lemma.
Canescent—grey pubescent or hairy.
Capillary—very slender or hair-like.
Capitate—in a globular cluster or head.
Carinate—keeled; flattened laterally.
Cartilaginous—hard and tough, but elastic like cartilage.
Caryopsis—the grain or fruit of grasses.
Cæspitose—tufted.
Chartaceous—having the texture of writing-paper.
Ciliate—fringed with hairs (like an eyelash).
Circinate—coiled from the top downward.
Cleistogamous—applied to flowers or florets when fertilized without opening.
Collar—the area on the outer side of a leaf at the junction of sheath and blade.
Continuous—said of the rachis, which does not disarticulate.
Contracted—said of inflorescences that are narrow or dense.
Convex—rounded on the back, instead of keeled.
Convolute—rolled longitudinally.
Cordate—heart-shaped.
Coriaceous—leathery in texture.
Crown—the persistent base of a tufted perennial herbaceous grass.
Cuculatte—hooded or hood-shaped.
Culm—the jointed stem of grasses.

Cuneate—wedge-shaped with the narrow part below.
Cuspidate—tipped with a sharp, short, rigid point.
Deciduous—falling away, the opposite of persistent.
Decumbent—curved upward from a horizontal or inclined base.
Decurrent—extending down an organ below the insertion, as with ligules.
Dehiscence—spontaneous opening of an organ, as the opening of anthers to let out pollen.
Dense—said of inflorescence in which the spikelets are crowded.
Diffuse—open and much branched.
Digitate—several members arising from the summit of a support.
Diæcious—the two kinds of flowers on separate plants.
Disarticulating—separating at maturity.
Distichous—conspicuously two-ranked.
Divaricate—widely and stiffly divergent.
Dorsal—relating to the back of an organ.
Drooping—inclining downward, as the branches of a panicle.
Elongate—narrow, the length many times the width.
Emarginate—notched at the apex.
Entire—a margin without lobes.
Erose—irregularly notched at apex as if gnawed.
Excurrent—running beyond. The midnerve is excurrent from the lemma as an awn in many grasses.
Exserted—protruding.
Fascicle—a little bundle or cluster.
Fertile—capable of producing fruit; having pistils.
Fibrillose—furnished with fibers.
Filiform—thread-like.
Fimbriate—fringed with long coarse hairs.
Flexuous—zigzag, bent alternately in opposite directions.
Floret—the lemma and palea with included flower.
Fruit—the ripened pistil. In grasses the fruit is usually a caryopsis.
Fusiform—spindle-shaped.
Geniculate—bent abruptly.
Glabrous—without hairs, usually smooth.
Glaucous—covered with a waxy coating that gives a blue-green colour as in the leaf of the cabbage.

Glomerate—collected in heads.

Glumes—the pair of bracts at the base of a spikelet.

Habitat—the situation or surroundings in which a plant grows.

Herbaceous—having the characters of an herb, thin in texture and green in colour.

Hirsute—pubescent with straight, rather stiff hairs.

Hispid—pubescent with stiff or rigid hairs.

Hyaline—thin and translucent or transparent.

Imbricate—overlapping.

Indurate—hard.

Inflated—puffed up; bladdery.

Inflorescence—the flowering part of a plant.

Innovations—the basal shoot of a perennial grass.

Internerves—the space between the nerves.

Internode—the part of a stem between two successive nodes.

Interrupted—the continuity broken, said especially of dense inflorescences.

Involucre—a circle of bracts below a flower or flower cluster.

Involute—rolled inward from the edges.

Joint—the node of a grass culm.

Keel—the sharp fold at the back of a blade, glume, or lemma.

Laciniate—cut into deep narrow lobes.

Lanate—woolly, clothed with long tangled hairs.

Lanceolate—rather narrow, tapering at both ends.

Laterally—compressed, flattened from the sides.

Lax—loose.

Lemma—the bracts arising from the rachilla of a spikelet above the glumes.

Ligule—the thin appendage on the inside of a leaf at the junction of sheath and blade.

Linear—long and narrow with parallel sides.

Loose—open, said of panicles.

Membranous—thin like a membrane.

Monœcious—the two kinds of flowers on the same plant as in corn.

Mucro—A minute awn.

Mucronate—provided with a mucro.

Navicular—boat-shaped, like the bow of a canoe.

Nerve—the vascular veins of the blades, glumes, and lemmas.
Node—the joint of a culm.
Obsolete—Almost wanting.
Obtuse—rounded at the apex; contrasted with acute.
Open—loose, said of panicles.
Palea—the inner bract of a floret.
Panicle—an inflorescence with a main axis and subdivided branches.
Papilla—a minute nipple-shaped projection.
Pectinate—comb-like.
Pedicel—the stalk of a spikelet.
Pedicellate—having a pedicel.
Peduncle—the stalk of stem of an inflorescence.
Perennial—lasting more than one year.
Persistent—remaining attached.
Petiole—the stalk of a leaf blade.
Pilose—pubescent with soft straight hairs.
Pistil—consists of the ovary, style, and stigma.
Pistillate—applied to flowers bearing pistils only.
Plumose—feathered, having fine hairs on each side.
Puberulent—covered with soft hairs.
Pubescence—a hairy covering.
Pyramidal—pyramid-shaped.
Pyriform—pear-shaped.
Raceme—an inflorescence in which the spikelets are pediceled on a rachis.
Racemose—In racemes.
Rachilla—a small rachis.
Rachis—the axis of a spike or raceme.
Reticulate—In a network.
Retrorse—pointing backward, as the hairs on the sheaths of certain species of *Bromus*.
Revolute—turned or rolled back from both edges.
Rhizome—an underground stem, more or less elongated.
Rugose—wrinkled.
Saccate—bag or sac-shaped.
Scaberulous—minutely scabrous.

Scabrous—rough to the touch, covered with minute points or very short stiff hairs.

Scarious—thin, dry, and membranaceous, not green.

Serrate—saw-toothed.

Sessile—without a pedicel or stalk.

Setaceous—bristle-like.

Sheath—the lower part of a leaf that encloses the stem.

Spike—an unbranched inflorescence.

Spikelet—the unit of inflorescence in grasses, consisting of two glumes and on or more florets.

Stamen—the part of the flower that bears the pollen.

Staminate—containing stamens only.

Striate—marked with fine parallel lines or minute ridges.

Strigose—with appressed stiff hairs.

Sub—a prefix to denote somewhat, slightly, or in a less degree; as subacute, somewhat acute.

Subulate—awl-shaped.

Succulent—fleshy or juicy.

Tawny—pale brown or dirty yellow.

Terete—cylindric and slender.

Trifid—divided into three parts.

Truncate—ending abruptly as if cut off.

Turgid—swollen.

Unilateral—one-sided or turned to one side.

Verticillate—in verticels or whorls.

Villous—pubescent with long soft hairs.

Web—the cluster of slender soft hairs at the base of the floret in certain species of *Poa*.

Whorl—a cluster of several branches around the axis of an inflorescence.

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